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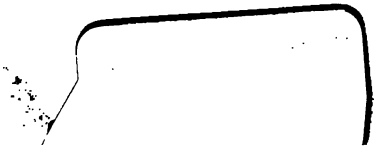
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THE HERRING
AND THE
HERRING FISHERY

DE CAUX.



THE HERRING AND THE HERRING FISHERY.

THE

HERRING

AND THE

HERRING FISHERY,

WITH CHAPTERS ON

FISHES AND FISHING,

AND

OUR SEA FISHERIES IN THE FUTURE.

BY

J. W. de CAUX.

"The herring is one of those productions which engage and decide the history of nations."—*La Cépède.*



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1881.

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TO

EDWARD BIRKBECK, ESQ., M.P.—

WHOSE INTELLIGENT

APPRECIATION OF, AND UNWEARYING DEVOTION TO,

THE INTERESTS OF BRITISH FISHERMEN,

ARE DESERVING OF UNIVERSAL ADMIRATION—

THIS LITTLE BOOK

IS RESPECTFULLY DEDICATED BY

THE AUTHOR.

PREFACE.

THE Preface is to a book what the beard is to an oyster. Beards and prefaces are useful and ornamental appendages to oysters and books; but the oyster-loving gourmand gulps down only the body of the mollusk, whilst the general reader devours, if he read at all, only the book itself. The beard of the oyster is interesting solely to the naturalist, and the preface to a book has charms for the bookworm alone. Yet the preface, like the postscript to a letter, generally contains the brightest jewel of the writer's thoughts. In this respect my preface will be disappointing because my book, being plain matter of fact, contains all that I have to say. Reader! my task is finished.

The oyster—my little book—a real native, lies open before you. Gulp it down or swallow it at your leisure, as you may be minded; but, whichever you do, may it please your palate and satisfy your digestion.

GREAT YARMOUTH,
OCTOBER, 1881.

THE HERRING AND THE HERRING FISHERY.

CHAPTER I.

FISHES AND FISHING.

National importance of the sea fisheries—Number of fishing vessels—Depreciation of fishing vessels and fishing gear—Capital invested would farm 6,000,000 of acres of land—Number of persons employed in the sea fisheries—Cost of counting herrings—Origin of fishing shrouded in the mists of ages—Mutterings of the mummy—Biblical references to fishing—Pisciculture and trawling practised by the ancients—Natural history of fishes—Ignorance regarding fish-life—Surface-swimming fishes—Ground fishes—Herrings and mackerel caught in trawl-nets—Respiration—Tenacity of life—Swimming against the tide—Are fishes cold-blooded?—Temperature of the sea—Can fishes live in great extremes of temperature?—Water below the surface not subject to great or sudden changes of temperature—Colours and forms of fishes—The mackerel the swiftest of all fishes—Uses of the fins and air-bladder—"Blown" fishes—Pricking the air-bladder—Specific gravity of sea-water—Blind fishes—Do fishes sleep?—Can fishes see in the dark?—Can fishes hear?—Are fishes voiceless?—The "bark" of the conger-eel—The "squeak" of the herring—Have fishes the sense of feeling?—Can fishes taste and smell?—Food of the crab and the lobster—Fishes do not masticate—Voracity of fishes—Fishes do not eat old boots—Food of fishes—The medusæ—Captain Scoresby—Diseases of fishes—Parasites—Frank Buckland.

OUR sea fisheries are subjects of such paramount importance that they deserve the serious consideration, if not the attentive study, of all classes of society, from the cabinet ministers themselves downwards. Indeed, from a national point of view, their importance can hardly be over-estimated.

According to the most reliable statistics, there are, fishing round the coasts of this island, no less than 30,000 vessels, of which, the greater number by far is composed of herring boats. These vessels exceed by 8,000 the number of ships which form our mercantile marine—a mercantile marine which is the admiration and envy of the World. These 30,000 fishing vessels are of 280,000 tons burthen, and the capital which is employed in their out-fit would be amply sufficient—calculating at the rate of £10 per acre—for the farming of, at least, 1,500,000 acres of land, a quantity of land which is far greater than the area of the large county of Norfolk. But this statement, important as it is, gives only a faint notion of the capital employed, because, whilst land is indestructible, fishing-boats and fishing gear rapidly depreciate in value, and very soon are absolutely destroyed. Fishing-boats and their stores—irrespective of extraordinary losses—depreciate in value at the rate of, at least, 10 per cent. per annum; whilst the actual fishing gear depreciates in value at double that rate. I am well within the mark, therefore, in estimating the depreciation all round at 12 per cent., a calculation which means, that all the fishing property actually employed at sea has virtually to be replaced in between eight and nine years. This being so, the capital employed is amply sufficient for the farming, not of 1,500,000 acres of land, but of 6,000,000 of acres, or about one-sixth of the land in the United

Kingdom which is now under cultivation. And the illustration holds good in every respect, because the rents and rates of store-houses and net-chambers, and the amounts paid for wages, maintenance of crews—for fishermen have to be fed as well as to be paid for their services,—salt and ice for the preservation of the fish, towages, port dues, wharf dues, and other incidental expenses, are fully equal to the rents, rates, tithes, wages, and all other charges which farmers are called upon to pay.

These 30,000 fishing vessels are manned and worked by some 105,000 men and boys. But, besides these men and boys who are actually and constantly employed at sea, there are, at least, another 105,000 persons who, on shore, are directly connected with the sea fisheries. These 210,000 persons, being principally the heads of families, represent a population of more than 750,000 souls, all of whom are dependent upon the sea fisheries for their daily bread. These figures, however, large as they are, give but an approximate idea of the national importance of the subject, because the sea fisheries give employment, more or less directly, to a still greater number of people. It so happens that every operation in connection with the sea fisheries requires physical and intelligent labour; no matter whether it be building or repairing the boats and their appurtenances, whether it be making or repairing the gear with which the fish are caught,

or whether it be the catching or the delivering of the fish;—at every stage, from the building of the boat and the making of the net, to the actual delivery of the fish to the consumer, intelligent manual labour is and must be employed. And it needs no study of Adam Smith to convince a reasonable man, that the wealth and happiness of a nation depend largely upon the comparative prosperity of the working man. In illustration of this point I may say, that every season, on an average, the operation of counting the herrings landed at the fish-wharf at Great Yarmouth costs upwards of £2200; while for simply helping to lift the herrings from the ground on to the carts which convey them from the wharf to the various curing-houses, or to the railway stations, no less a sum than £370 is paid. Other equally surprising and incontrovertible facts might be adduced to prove how important the fishing industry is to the nation at large; but these must suffice.

A popular history of our sea fisheries has yet to be written; or rather, a history of our sea fisheries written in a popular manner has yet to be produced. The little information, comparatively speaking, which we possess with regard to the history of our sea fisheries, and the life and habits of the fishes themselves, is hidden away and scattered about in commissioners' reports, scientific works—some of which are little more than mere catalogues,—newspaper columns, and controversial books, the prolixity

of which would bore and tire out the ordinary reader. I use the term "little information" advisedly. It would be extremely interesting to know when fishes were first used as human food, whether they were first caught by hook or by net, when hooks and when nets were invented, who were their inventors, and other information of a like character; but all such knowledge is buried in the mists of ages. As far as I know, there is absolutely no record of any one of these interesting events.

That sea fishing, both with hooks and with nets, is of very remote origin I firmly believe; and I am strongly of opinion that, until the last fifty years, no great alteration or improvement in the ancient modes of fishing have taken place. These modes had undoubtedly one common origin, as is proved by the similarity in the operations of fishing all over the world. At the International Fishery Exhibition at Berlin, one of the most beautiful models was in the Japanese section, and this model faithfully represented a large party of men engaged in the act of "drawing" for fishes exactly as that operation is performed along our own shores.

There can be no doubt, from the marvellous works which are still in existence in the land of Egypt and elsewhere, that those descendants of Noah who looked upon the world

> "When it was fresh and young,
> And the great deluge still had left it green,"

were more highly civilized, and were possessed of far greater knowledge than is generally supposed. You have, I doubt not, read the clever "Address to a Mummy," which was written by Horace Smith, and the equally happy reply. Some of the mutterings of the mummy which the poet hears in his fancy he thus translates:—

"Who'd think these rusty hams of mine were seated
At Dido's table, when the wondrous tale
Of Juno's hatred was so well repeated?
And ever and anon the queen turned pale.
Meanwhile the brilliant gas-lights hung above her
Cast a wild glare upon her shipwrecked lover.

"Gaslights? Ay gaslights! We men of yore
Were versed in all the learning you can mention.
Who hath not heard of Egypt's peerless lore?
Her patient toil? Acuteness of invention?
Survey the proofs! The pyramids are thriving!
Old Memnon still looks young! And I'm surviving!

"A land of arts and sciences prolific,
On blocks gigantic building up her fame!
Crowded with signs and letters hieroglyphic,
Temples and obelisks her skill proclaim!
Yet, though her art and toil unearthly seem,
Those blocks were brought on railroads and by steam!"

It may be that gas, and steam, and railroads, and even electricity were known in those days. Certain, however, it is, that the sea as well as the land contributed to the sustenance of mankind; and inasmuch as it is as equally true of fishes as it is of hares, that they must be caught before they can be eaten, it is only reasonable to suppose that hooks and nets

of some form and construction, and made of some sort of materials, were known to the fishermen of that remote period. When, and by whom, however, they were invented and first used, are questions which must remain unanswered. In the words of the mummy:—

> "Till Science's self unbinds them,
> Men e'en must take these secrets as they find them."

The Bible contains numerous references to fishes, fishermen, hooks, and nets. The two most remarkable passages in the Old Testament which I have come across in my reading are to be found in Isaiah, who flourished about 2640 years ago, and in Habakkuk, who lived some eighty years later. Verses 8, 9, and 10 of the 19th of Isaiah are as follows:—"8. The fishers also shall mourn, and all they that cast angle into the brooks shall lament, and they that spread nets upon the waters shall languish. 9. Moreover they that work in fine flax, and they that weave networks, shall be confounded. 10. And they shall be broken in the purposes thereof, all that make sluices and ponds for fish." These words clearly prove that, at that time, not only were fishes caught with hooks and lines, and with nets, but that nets were woven of flax or some similar material, and that pisciculture itself was understood and practised. The passage in Habakkuk, 1st chapter, 15th and 16th verses, is quite as remarkable. The words are these:—"15. They take up all of them with the

angle, they catch them in their net, and gather them in their drag; therefore they rejoice and are glad. 16. Therefore they sacrifice unto their net, and burn incense unto their drag; because by them their portion is fat, and their meat plenteous." To my mind, this passage proves not only that line and net fishing were well known, but that "dragging" for ground-fishes, or "trawling" as we moderns call it, was also practised. The only passage in the New Testament to which I shall call attention, is contained in the 5th verse of the 5th chapter of St. Luke. It is the Apostle Peter's reply to the command of Christ to push his boat further from the shore, and to cast his nets into deep water. "Master, we have toiled all the night, and have taken nothing." That is a most remarkable statement. It is a well-known fact that during daylight, and especially in clear water, fishes will not go near a net; and that even "drawing," whether from the shore or from boats, is, under such circumstances, attended with considerable disadvantages. Peter's exclamation, however, proves that this well-known fact was equally well known in those days; and to my mind, the fact that the fishes were caught at a time when they would instinctively avoid a net, enhances in a startling degree the wonderful miracle which Christ then wrought.

In natural history fishes belong to the order of vertebrate animals, and are placed fourth, or lowest

in the scale of organization. It is much to be regretted that they have been classified differently by different naturalists, and steps should be taken to secure uniformity in this respect in the future. Some hundreds of different species have already been described and classified; but there are many fishes, I doubt not, which are still unknown to the scientific world. Of sea-fishes generally but little is known beyond their internal structure and organization, and their external characteristics. The sea, like all animated nature, is merciless. Naturalists cannot descend into it and live; hence the conditions of life within it are comparatively unknown, and its secrets are kept with the solemnity of an eternal silence.

Some naturalists have divided fishes into three great classes;—those which invariably live at the bottom of the sea, those which invariably live in mid-water, and those which invariably live at or near to the surface. But such a division is most erroneous and misleading. As a matter of fact, there are no such fishes as surface-swimmers; herrings and mackerel, which are types of this supposed class, are more often fathoms below the surface than they are near to it. At times, too, the so-called surface-swimming fishes keep very close to the bottom of the sea, and it is, in consequence, no uncommon circumstance for both herrings and mackerel to be caught in trawl-nets. In the autumn of 1859 more than 1000 large full herrings were caught off Lowestoft in the trawl-

net of the smack "Andrew Marvel," which belonged to Mr. Davie, of Great Yarmouth. In the spring-time of 1870 upwards of 5000 shotten herrings were caught in the trawl-net of the smack "John and Edmund," belonging to Mr. John Beckett, also of Great Yarmouth. This vessel was trawling at the time upon the Well Bank, and the "school" which she struck must have been a large one, because an immense quantity of herrings escaped through the large meshes of the "uppers" whilst the net was being hauled up and into the boat. And in March, 1881, a large quantity of both shotten and full herrings were caught upon the Brown Bank in the trawl-net of the "Two Friends," belonging to Mr. Henry J. Brown, of Caister. For descriptive purposes fishes may be divided into two great classes, ground-fishes and swimming-fishes; the ground-fishes being all those fishes which invariably keep close to the bottom of the sea, while the swimming-fishes are all the other fishes which roam at their own sweet wills through the world of waters.

The forms and shapes of fishes are extremely diversified; but, generally speaking, they are elongated, and may be divided roughly into flat and round. With some few exceptions, which serve to prove and illustrate the rule, ground-fishes are invariably flat, whilst swimming-fishes are as invariably round. Ground-fishes are more tenacious of life than their more lively brethren, and this is believed to be due

to their possessing a lower degree of respiration, and, therefore, requiring a much smaller amount of oxygen in order to exist. Fishes breathe through their gills, which are their lungs; and when these become dry, death ensues from suffocation. All fishes, even the most delicate, may be kept alive for a long time by protecting them from the atmosphere, and by keeping their bodies moist and their gills saturated with water. Mackerel and herrings do not die so easily as it is popularly supposed they do. The suddenness of their deaths is due to the manner in which they are caught. When the mesh of the net entirely surrounds, or gets under, the gill-covers, the fish is suffocated exactly as a human being would be with a bandage tied tightly round his neck, or with something thrust down his windpipe. Those fishes which die soonest are those which require most oxygen, and the flesh of such fishes rapidly decomposes. Hence it is that herrings, mackerel, mullets, whitings, and other fishes of a like description, should be eaten as fresh as possible; whilst soles, turbots, and other similar fishes, like wildfowl and meat, improve with "keeping" in cold weather. This necessity for oxygen may, perhaps, be the reason why fishes in a tideway, when not chased or otherwise frightened, almost invariably swim with their heads towards the tide. Were this not the case, it would be very difficult to catch fish with other than "set nets," because both trawlers and drift-boats must work with

the tide. When the water is "slack"—that is, when there is no tide—such fishes as herrings swim in circles, and "with the sun," as it is termed; this fact I have repeatedly observed in the tank of an aquarium.

Fishes are believed, from their hearts being each composed of only one auricle and one ventricle, to be cold-blooded; that is, their blood is but little, if any, above the temperature of the water by which they are surrounded. Some naturalists believe it to be from two to three degrees above the temperature of the surrounding water. For my own part, I think that the temperature of the blood varies in different fishes, and that it depends very much upon the latitude and the temperature of the water itself. This, I think, is proved by the facts, that swimming-fishes come nearest to the surface when the weather is warm; and that they, as well as ground-fishes, seek the deepest parts of the sea in very cold weather. The temperature of the sea varies with the seasons. The water in the North Sea is at its coldest in March, and at its warmest in August. The water also varies in temperature according to its depth. When I was in the North Sea in the latter part of January, 1880, I found that in a depth of about twenty-five fathoms, the water was from one to two degrees warmer at the bottom than it was at the surface; whilst, at the latter end of June, 1881, I found that, at about the same depth, it was just one degree colder than it was

at the surface. To my mind, these facts prove that fishes are not so cold-blooded as they are supposed to be, but that they are susceptible of, and sensitive to, the changes of temperature.

Some naturalists affirm that fishes, even the same fishes, can live in great extremes of both high and low temperatures. Goldfishes, we are told, thrive in water at a temperature of eighty degrees; and it is said that fishes exist in the hot springs of various countries, the temperatures of which vary from one hundred and thirteen to one hundred and twenty degrees—indeed, Humboldt and Bonpland assert that, when travelling in South America, they saw fishes thrown up alive, and apparently in good health, from the bottom of a volcano, the water in which was but a few degrees below boiling-point. On the other hand, Mr. Jesse tells the tale of a goldfish that was frozen up until the water in which it was became a solid mass of ice, but that, on the ice being thawed, the fish recovered, and before long was as lively as ever. Perch, carp, and other fishes, we are told, have been carried miles in a frozen state without injury; and it is asserted that, in the northern parts of Europe, eels in a similar state have been transported long distances without destroying life. I mention these statements simply for your information; I do not ask you to believe them. In my opinion they are gross exaggerations. Fishes can neither be parboiled or frozen and live; such temperatures as are here

referred to must destroy life. Moreover, it must be borne in mind that water at the bottom of the sea never sinks to a lower temperature than from eight to ten degrees above the freezing, or rather, the frozen point; because, so soon as water begins to freeze—which it does at a temperature of from eight to ten degrees above the frozen point—it begins to expand in volume, and necessarily rises to the surface, where it is transformed into ice. The water at the bottom of a river, therefore, even when the surface is frozen over, is never much lower than forty degrees; whilst the water in the Arctic Ocean itself beneath the ice, even in the depth of winter—allowing ten degrees as the difference between the freezing temperatures of fresh and salt water—is never much lower than thirty degrees. This is a most marvellous provision of Nature, and goes a long way to account for the wonderful profusion and immensity of the organized beings with which she has peopled even the wild waters, and still wilder shores, of the polar circle.

The swimming-fishes are more beautiful in colour, and more elegant in form, than are the ground-fishes. To paint the delicate chamelion hues of some fishes is as difficult a task as to paint a sunset, or the full moon. In the American section of the International Fishery Exhibition held at Berlin, I saw the finest painting of a live mackerel that I have ever seen. The mackerel is supposed to be the swiftest fish in

the sea, and hence it is believed that vessels modeled after its shape must be the best to cleave through the water.

The principal source of locomotion is the tail and the tail-fin; the other fins are mainly useful in regulating the position of the fish in the water, and the direction in which it desires to go. Leeuwenhoeck says: "Before I threw my last carp into the water, I took out my scissors and clipped his fins, imagining that by that means he would be rendered incapable of swimming; but contrary to my expectations, he advanced, struck down to the bottom of the basin, and rose again. He was always turned, I confess, either on one side or the other, but with his back downwards, and could never swim as before upon his belly."

The fins upon the back are called "dorsal" fins, those upon the shoulders "pectoral" fins, those upon the belly "ventral" fins, and those upon the under-part of the tail "anal" fins; the fin at the end of the tail is known as the "caudal" fin. Some fishes are also provided with smaller fins, which are called "finlets." These fins and finlets are amongst the most distinctive external characteristics of fishes; and varying, as the ventral fins do in position, and as the dorsal and anal fins do in number as well as position, they assist greatly in dividing fishes into families and species. Why, however, the fins in different families of fishes should so vary nobody

can say; but we may safely conclude, that notwithstanding our ignorance, the Creator produced such variations for some wise and beneficent purpose.

A very important internal organ of swimming-fishes is the air or swimming bladder. This bladder, which is filled with air, materially assists the fish in ascending or descending in the water, the fish having the power to contract or inflate it at pleasure. When this bladder becomes over-inflated—as it will sometimes do from a variety of causes—the fish is known as being "blown;" and it is then in a most pitiable condition, being unable to descend, and compelled to keep at the very surface of the water. This is one of the reasons why so many fishes die in aquaria. Cod-catchers keep their cods alive in wells, which are made in the bottoms of the vessels, and which communicate directly with the sea. But, before putting the cod into the well, the fisherman pricks the air-bladder with a long needle, by which means the super-abundant amount of air in the bladder is got rid of, and the fish is able to immerse itself in the water and so live. The puncture is made just in the pit of one of the pectoral fins, generally the left one; and fishermen tell me, that as soon as it is made, the air may be felt rushing out. This operation is called "winding the fish;" and the necessity for it is perceived, when it is remembered that the specific gravity of a fish is about that of the element in which it lives. The importance of this organ

is enhanced by the fact, that the specific gravity of water is different in different parts of the globe. The water of the Baltic is denser than that of the North Sea, and the water of the Dead Sea is denser still; but, no matter what the variation may be, the air or swimming bladder enables a fish to accommodate itself to it.

It is a matter of doubt how many senses fishes possess, and whether their senses are acute or not. It would be a bold thing to say that all fishes can see, because fishes without eyes have been found in the waters of caverns to which daylight never penetrates. A notable example is the blind-fish (*Amblyopsis spelæus*), which inhabits the lakelets that are found in the subterranean and perfectly dark grottoes of Kentucky, U. S. The head of this fish is naked, although its body is covered with scales, and the places where the eyes should be are simply indicated by two small black dots. That Nature makes no organs that are useless to their possessors is borne out by the recent researches of the Challenger Expedition. It was found that at the bottom of those watery abysses, the depths of which are measured by furlongs and not by fathoms, the eyes of the creatures living there are either expanded to a very large size, in order to catch any truant ray of light that may straggle through those regions of darkness, or that they are atrophied for want of use, and apparently changed into other organs with

functions as yet unknown. As a rule, however, fishes not only have eyes, but are possessed of a very keen sight. That they can see to any great distance is open to doubt, except it be in very deep, very clear, and very still water. Their eyes are generally large and prominent; in some they almost protrude from the head, whilst in others they are deep-seated.

Very few fishes can close their eyes. Whether they sleep or not has yet to be discovered; but, judging from analogy, I am of opinion that they both rest and sleep. I do not think they can see very well in the dark; if they could, they would be as difficult to catch with a net at night as they are during the day. I have already pointed out that it is very difficult to catch fish with a net in clear water during daylight, and a somewhat similar state of things prevails when the sea is clear and phosphorescent or luminous at night. Fishermen have told me, that when the "water burns"—that is, when the sea is phosphorescent—herrings may be seen to swim quite up to the net, and then to dart away again like flashes of lightning.

Notwithstanding the great authorities to the contrary, I incline to the opinion that fishes cannot hear. If they possess the sense of hearing at all, they do so in only a very limited degree. Although the surface of the sea when smooth is a magnificent conductor of sound, water itself is an extremely bad conductor. A fish swimming beneath the surface is noiseless in

its movements; "schools" of herrings, or a whale, would swim past a fishing-boat unperceived, so far as sound is concerned, did not they or it disturb the surface of the water. I was never more startled in my life than I was on two separate occasions in bright daylight by two separate mammals, and I mention the circumstances in order to illustrate the fact that I have stated. On the first occasion I was swimming in Yarmouth roads, when a porpoise rolled over only a few feet ahead of me; it made no noise whatever, and I should not have known of its proximity, had I not seen it lift itself above the surface of the waves. On the second occasion, I was out in the North Sea during the autumnal herring fishing, and was leaning against the rail of the vessel, when a huge "blow-fish," as fishermen call all mammals, suddenly rushed out of the water, as it were, within a very few yards of where I was standing. The fish itself was a small rorqual *(Balænoptera rostrata)*. It disappeared again in an instant, but during that instant I could smell it as well as see it and hear it. The noise it made, however, was produced by the disturbance of the surface-water, because, although it was swimming at a very rapid rate, no one on board was aware of its presence until it actually came out of the water. As, therefore, as far as we know, or can judge by analogy, sound cannot be produced beneath the surface of the sea, no advantage would be derived by a fish from the sense of

hearing. Its best sentinel to warn it of danger is sight; because the merest shadow, produced either by the disturbance of the surface-water, or by any other cause, is sufficient to warn it of the approach of an enemy. From personal experience I know that human beings cannot hear any external sounds when immersed below the surface of the sea; and it is beyond all doubt that those marine animals which live in the ocean, but which must come to the surface to breathe, cannot hear anything that is beneath the water. This is proved by the manner in which the polar bear catches seals and other cetaceans. Captain Lyon, who accompanied Captain Parry in his second expedition to the arctic regions in 1821, thus describes the manner in which the polar bear surprises his victim:—"On seeing his intended prey, he gets quietly into the water, and swims to a leeward position, from whence, by frequent short dives, he *silently* makes his approaches, and so arranges his distances, that at the last dive he comes to the spot where the seal is lying. If the poor animal attempt to escape by rolling into the water, he falls into the paws of his enemy; if, on the contrary, he lie still, his destroyer makes a powerful spring, kills him on the ice, and devours him at his leisure." As, therefore, deafness can be no disadvantage to a fish, I am incredulous as to its sense of hearing.

Moreover, fishes are voiceless. All prime edible fishes are gutted alive as soon as they are caught,

in order that they may "keep the better," and, when the knife is being used upon them, they writhe convulsively, but make no noise whatever. Occasionally, when out of the water, fishes emit sounds, but such sounds are as unnatural as they are involuntary. A conger-eel, when out of the water, is said to "bark like a dog," but such a statement is very misleading. When enraged,—as who would not be with a hook in one's mouth?—a conger-eel will sometimes make a noise, but the sound is not loud, and it resembles that which is made by a man when he is endeavouring to "clear his throat;" and, for aught I know to the contrary, it may be produced by the same cause. Herrings, when hauled alive, will occasionally make a slight noise, but there is little doubt that such sounds are due to external pressure. Some persons speak of the sound as being a kind of squeak, but it resembles a sneeze rather than a squeak. The nearest approach to the sound is the word "cheese," and that it is so is proved by the fact that fishermen, when they hear it, call out, "Don't sing out cheese; we want you for bread!" How these sounds are produced is unknown. That they are spasmodic and unnatural there can be no doubt, because, when completely immersed in water, no fish can make any sound whatever. We know that Nature does not produce or perpetuate organs that are useless to their possessors; and, therefore, for the reasons I have stated, I agree with those naturalists who

believe that fishes can not hear. I am aware that strong arguments have been adduced in support of the theory that fishes can hear; but, as yet, nothing has been observed that cannot be accounted for by keenness of vision and the sense of feeling. A deaf person can tell what another person says by the mere motion of the lips; and he knows when a cannon is fired off, not because he can hear the explosion, but because he can see the flash and the smoke, or because he can feel the concussion which the explosion causes in the air. The statements that herrings have been frightened from parts of the coast by the ringing of bells and the firing of cannon are old-wives' tales. If such statements were true, the steamships which are continually rushing over the fishing-grounds ought long ago to have frightened away every herring.

Some naturalists tell us that fishes have little or no feeling, and that, in consequence, they are nearly insensible to pain. My observations lead me to quite a different conclusion. I consider angling simply for "sport," as it is termed, to be a cruel and barbarous amusement; and this may the more readily be believed when it is remembered that the sense of touch or feeling seems to have its chief seat in the mouth and the surrounding parts. The contortions of a fish when hooked, or otherwise severely injured, can only be attributed to a sense of excruciating pain. Nip the tail of a live sole which has been caught in

a net, but which is half dead from exposure to the atmosphere, and the way in which it will lift its head and turn it towards the part nipped, ought to convince any reasonable being that it can feel, and acutely too. Years ago, when dog-fishes (*Squalus acanthias*) were such a trouble to our drift-net fishermen, it was no uncommon circumstance for the fishermen to cut off the ends of the noses of the dog-fishes, and then to throw the dog-fishes back again into the sea; and eye-witnesses have told me, that no sooner were the wretched dog-fishes in the water, than they would thrust their noses above the surface, an action which clearly proved that even the salt water upon their injured snouts caused them intense pain.

The fastidious way in which fishes will swim round and touch bait before attempting to eat it, and their avoidance of polluted water, sufficiently attest that they can both smell and taste. Whether these senses are dull or acute can only be inferred; but I am inclined to think that they are somewhat pronounced. No better illustration can be offered than that of those crustaceans the crab and the lobster. The plebeian crab feeds only upon the purest and freshest of food; whilst the patrician lobster, having a more aristocratic taste, revels upon garbage, which has an extremely high and "gamy" flavour. I think the sense of smell is superior to that of taste, because fishes do not masticate their food—they swallow it rapidly; indeed, as a rule, they bolt it. Herrings

taken from the bellies of cod-fishes show no marks of having been chewed, and are often quite uninjured; and even a large sole, uninjured and comparatively fresh, has been taken out of the stomach of a cod-fish.

As a rule, fishes are not particularly dainty as to the food which they eat. The voracity of some fishes is very great; but I do not believe that it extends to the eating of pieces of canvas, old boots, and such-like rubbish. It is true that such articles have been found in the stomachs of cods and other fishes, but they have not been swallowed by the fishes themselves; but have been put there by way of a "lark," or for the purpose of increasing the size and weight of the fishes into which they have been crammed. Fishmongers often blow air into cod-fishes in order to make them look plump, in the same way as butchers blow air into veal in order to improve its appearance.

The larger species of fishes are all carnivorous, and feed upon their smaller brethren; whilst the smaller species eat young fry, spawn, worms, and it may be weeds and grasses. The basis of subsistence, however, is undoubtedly to be found in those medusan races, which are generally too small to be discerned without the aid of a microscope, but which, like insects on the land, swarm in such incalculable millions, that, at times, they give to parts of the sea a peculiar tinge. Captain Scoresby once calculated

that two square miles of the Greenland Sea contained of them 23,888 billions, a number so exceeding all our conceptions, that he illustrates it by saying that 80,000 persons would have been employed since the creation of the world in counting it. When large enough to be easily discerned by the naked eye, these medusæ appear to be round, soft, elastic, gelatinous substances; they exhibit no signs of life beyond shrinking when touched, and are eagerly devoured by all the finny tribes. To fishermen they are known by the name of "jellies." In the autumn months they abound along the East Coast of England, as any swimmer who bathes there can testify.

It is believed that fishes are afflicted with but few diseases, and that any wounds they may receive heal rapidly, but that, owing to their rapacity and cannibalism, but few die a natural death. From the whale itself downwards, to the smallest fish, all inhabitants of the deep are pestered with parasites, so that it may be said literally of them, as it is of land animals, that

> "Big fleas and little fleas
> Have smaller fleas to bite 'em;
> The lesser fleas have smaller fleas,
> And so—*ad infinitum*."

There are, however, parasites and parasites; and one which fastens upon the larger kinds of swimming-fishes, not only feeds upon, but literally kills its victim. This parasite, which is something like a

slug, attaches itself to one of the gills of the fish, and thence sucks its life-blood. It is also said to find its way into the belly of the fish, to feed upon the vitals, and to eat its way out again through the solid flesh, leaving its victim a mere skeleton. But there are parasites which in reality are not parasites. The spat of oysters and mussels will frequently attach itself to crabs and lobsters, and there grow, impeding the movements of those crustaceans, but beyond that, being no nuisance. In 1880 I became possessed of a fine lobster, the under-part of which was completely covered with a cluster of twenty-seven half-grown mussels. This being a curiosity of curiosities, I sent it to my friend, the late Mr. Frank Buckland, for his fish museum at Kensington.

And here let me pay a parting tribute of respect to the memory of my deceased friend. Frank Buckland was one of the most genial and kind-hearted men I ever knew. He possessed a vast amount of zoological knowledge, which he readily imparted in a quaint and happy manner to others. In collecting information, and in testing alleged facts, he was indefatigable, and the enthusiasm which he threw into his work was contagious to all around him. He has died prematurely, but he has left behind him a rich legacy of knowledge which the world in due time will appreciate. By his death Government has lost a most valuable servant, the

general public a racy and entertaining writer, and the scientific world one of its chief ornaments. As long as the English language is spoken, and I for one believe that in the coming ages it will be the language of the world, Frank Buckland, the naturalist, will be honoured of all men, whilst in scientific circles his name will be a veritable household word.

CHAPTER II.

The Herring.

Derivation of the name—Description of the herring—Leach's herring—Strangely-marked herrings—Habitat of the herring—Fanciful ideas of naturalists—"Wine-drinkers," "loaders," "kings and queens," and "overday tarts"—Habits of the herring—Spawning—Surface-floating ova—Recuperative powers and fecundity of fishes—Immature fishes—Herrings the prey of mammals, fishes, and birds—Hatching—Are sprats young herrings?—Maturity and full-growth of herrings—Varieties of herrings—Monster herrings—Herrings as food and medicine.

The herring is to man the most valuable and, therefore, the most important fish that swims the northern seas. Some naturalists aver that its name is derived from the German noun *heer*, which signifies "an army;" but this statement is just as fanciful as many other of their statements. Herrings were known as a valuable food ages before Germans took any interest in maritime affairs, and it is not probable that in primitive times men went beyond their own language for nomenclature. The word is nothing more nor less than the Saxon noun *hæring* slightly altered in the spelling. The scientific name of the herring is *Clupea harengus;* and it belongs to the *Clupidæ* family of fishes.

The principal characteristics of the herring are as follows:—The head, measuring from the tip of the lower jaw to the edge of the gill-cover, is about one-fifth the entire length; the crown of it is flat and, to the eye of a fisherman, presents the outline of the deck of a fishing-boat. The eyes are large and beautiful, the pupil being intensely black and lustrous, and the iris silvery white; there are no eyelids. The lower jaw protrudes beyond the upper jaw, and is black at the point. The cheeks are movable and, when the mouth is closed, overlap the lower jaw; in each of them there is a very distinct and fair outline of a fishing-boat, with its mast laid exactly as it would be when actually engaged in drift fishing. The tongue is somewhat hard, and of a dark colour; and both it and the mouth are armed with minute teeth which, like the teeth of nearly all fishes, curve inwards. The gills are four in number on each side—the usual number in swimming-fishes,—and these are attached to the gill-cover or *operculum*, as it is technically called, by a delicate fringe of minute blood-vessels. The fins are seven in number; namely, one dorsal fin, two pectoral fins, two ventral fins, one anal fin, and one caudal fin, the last-named being divided into two large forks. The dorsal fin is situated somewhat nearer to the extreme end of the caudal fin than it is to the tip of the lower jaw, and the ventral fins are placed immediately beneath the centre part of it. Generally, the dorsal, pectoral, and

caudal fins are each formed of eighteen rays or spines, delicately, but firmly, joined together; the ventral fins of nine rays each, and the anal fin of seventeen rays; but these rays occasionally vary in number. I have counted as few as sixteen, and as many as nineteen rays in the dorsal fin. The scales are very delicate, and almost transparent; they lie over each other in regular lines, with the edges towards the tail, and may be easily detached. Beneath the scales there are diagonal lines, which proceed from each side over the back, and intersect each other at regular distances. These lines are of a very dark colour, and, in miniature, exactly resemble the net with which the fish is caught. Some fishermen are of opinion that it was these intersected lines which first gave man the idea of making a herring-net. The line along each side is called the "lateral line," whilst the line along the belly, from the throat to the tail-fin, is known as the "carinated line." The lateral line cannot be seen until the scales have been removed. The intersected diagonal lines which extend between the lateral and carinated lines are colourless. The air or swimming bladder is connected both with the stomach and the vent. The perfect skeleton—a most rare object, because of the delicate manipulation which is required for the dissection of the herring—presents a remarkable appearance. Around the shoulders the bones bristle with a startling effect; and being very strong and sharp, and curved towards

the tail, look in miniature like a clump of bayonets presented by a small body of foot-soldiers to resist an attack of cavalry. In all there are three hundred and seventy-one bones. The head contains twenty-eight bones, including the eight bony arches which support the gills. The vertebral column, which is placed in the centre of the fish, consists of fifty-six bones. The ribs number twenty-one on each side, or forty-two in all. The upper part of the vertebral column is furnished with fifty-six bones, which spring upwards from the joints, and taper in length towards the tail. The under-part of the vertebral column, at its posterior or hinder end, is similarly furnished with twenty-one bones, which curve downwards, and, with those above, form a half-circle. Between these and the ribs there are fourteen other bones, which become forked as they approach the ribs. Between the ribs and the bones which spring directly upwards from the vertebral column, there are on each side two rows of bones. Each upper row consists of twenty-one bones; these rows of bones spring obliquely from the upper parts of the vertebræ, and form the shoulders. Each lower row numbers fifty-six bones; these rows of bones spring laterally from the lower parts of the vertebræ, and assist in the formation of the lateral lines. Assuming that the fin-rays may be classed as bones, then the total number of bones in a herring amounts to no fewer than four hundred and seventy-eight.

Some writers have asserted that there are several species of herring; and Yarrell has described one which he calls Leach's herring (*Clupea Leachii*). According to his statement, this herring is only caught in the early part of the year, is about eight inches in length, and has but fifty-four *vertebræ* in its backbone. This latter statement is the crucial point. In order to test the accuracy of this assertion, I have dissected many herrings which were caught in the early spring; but I have never yet found, nor have any of those persons whom I have consulted upon the subject ever found, a herring answering to the description given by Leach; and, until stronger evidence be adduced, I shall continue to believe that there is only one species of the herring. Of course, there are varieties of herrings, just as there are varieties of mankind; but the difference between them is not greater, if indeed it be so great, as is the difference between the various races of men.

When first caught the herring looks, in the moonlight or early dawn, like a glittering piece of silver; on closer inspection, however, its belly is found to be silvery-white, its back and sides to be clothed with every shade of hue from light blue to dark green, whilst the whole body is lustrously iridescent. For hours after its death it presents a splendid appearance, but its hues of colour gradually darken. Various writers have affirmed that herrings have

been, and are, sometimes caught which are otherwise naturally marked in a most singular manner. In olden times these markings were believed to be of a very distinctive and important character, and, indeed, that they were of prophetic import. The story goes, that on November the 10th, 1587, two herrings were caught off the coast of Norway, the marks upon which resembled Gothic printed characters. These herrings were taken to Copenhagen, and duly presented as objects of great curiosity to Frederick II., who was then king of Denmark, to which country Norway was then subject. They were carefully examined by certain learned men of the time, who interpreted the characters to mean these words:—"You will not fish herrings in future so well as other nations," or, for an alternative interpretation was given, "Very soon you will cease to fish herrings as well as other people." There was nothing very alarming in these words, but, it is said, the king took them to heart, and soon died; and the vulgar belief was, that the two herrings were divine heralds of the king's death. I have never myself seen herrings marked in other than the usual fashion; but I believe that such freaks of nature do occur, as I have seen other fish marked in the most strange and unusual manner. That such markings or colourings are, however, messages from spirit-land is all moonshine.

The herring abounds in the northern seas from France to the North Cape, and in the North Atlantic

Ocean between forty and seventy degrees of latitude. On the southern coast of Greenland it is a rare fish, while on the northern shore a small variety of it only is found. This was discovered by Sir John Franklin in his first voyage to the arctic regions. The herring is not found in warm latitudes; and perhaps to this circumstance, as much as to any other, may be attributed the statements of the naturalists of the last century, who gravely affirmed that mighty swarms of herrings annually issued in the spring from the depths of the Arctic Ocean, and after making the circuit of these islands, *and spawning*, returned again to the polar seas. This idea is now entirely exploded. I have endeavoured, but in vain, to find out the origin of this marvellous statement. Yarrell quotes it from Pennant, but controverts it. Pennant is said to have invented it, or rather to have constructed it from the theories of fishermen. Long before Pennant wrote, however, the Abbé le Pluche makes the statement in the following remarkable terms:—"The exact time of their passage, and their peculiar track, are perfectly well known, which are very advantageous circumstances. They seem to have their principal rendezvous between the points of Scotland, Norway, and Denmark. From thence the Danish colonies take their annual progress, and, at different seasons, cross the channel. These, however, are not a gang of banditti that rove about at random. Their voyage is annually performed with the utmost

exactness. June and August are the two stated periods for their being in motion. Their track is prescribed, and their march regulated. The whole body moves at once. Not one of them presumes to straggle, pillage, or desert. They continue their march from one coast to another till the appointed period. They are a numerous nation, and their passage long. When the body, however, of their army is once passed, not one of the same species appears again till the year ensuing. Some speculative gentlemen have attempted to find out the secret motive that inspires the herrings with that taste for traveling, and that policy which is so inviolably observed amongst them."

The Abbé le Pluche published his "Philosophical Conversations" in the early part of the last century; and his authority for the statement in question was the naturalist Leeuwenhoeck, who flourished at an earlier period. But the idea was promulgated long before Leeuwenhoeck's time, because we find Manship referring to it in the most exact terms, and Manship completed his "History of Great Yarmouth" in the year 1619. We must, therefore, come to the conclusion that the idea originated hundreds of years ago—probably with some fishermen,—and that succeeding writers upon natural history adopted it without inquiry, and without consideration. A glimmering perception of the absurdity of the notion was, however, displayed in the time of Manship, as he

relates that some fishermen were of opinion that "herrings swim all the year round in the seas hereabouts." These fishermen belonged to that class of so-called wiseacres who unfortunately live before their time, and are not appreciated in the age in which they live, because their compeers are utterly unable to understand them. It is, however, matter of wonderment that any reasonable man, professing to be a naturalist, could assert that the shoals of herrings visiting these shores came from beneath the polar ice, and yet that *they spawned, and, therefore, reproduced their kind off these coasts, and not in the Arctic Ocean.*

Another fallacious statement of the older naturalists was, that this mighty army of herrings followed certain of their number, larger than the rest, called "kings," and that these leaders were held in such respect by the fishermen, that they studiously spared their majesties, and even liberated them when found in the net, lest, deprived of their royal guidance, the nation should not find the way to its accustomed haunts. This superstition is founded, I believe, upon a practice which pertains amongst fishermen to the present day. Occasionally herrings are caught, the fins of which are tinged with a beautiful bright red colour, whilst their bodies are suffused with a shadowy golden haze. By the Scotch fishermen these herrings are known as "wine-drinkers," by the fishermen along the coasts of Norfolk and Lincolnshire they are called "loaders,"

whilst by the west country fishermen they are honoured with the appellation of "kings and queens." Fishermen look upon these herrings as omens of success; and, as soon as one is perceived, it is taken from the net, carefully prevented from touching against anything that is made of wood, and at once passed round the scudding-pole as many times as the fishermen desire to get lasts of herrings at their next haul. Unsalted herrings, some twenty-four hours after their capture, present a dark red appearance about the gills and fins, which is due to the extravasation of blood; but this cannot be the cause of the appearance of the "wine-drinkers," "loaders," or "kings and queens," as fishermen assure me that they are sometimes captured alive, in which case, after having been passed round the scudding-pole, they are at once returned to their native element. Unsalted herrings of this description are called in the trade "overday-tarts," but sharp costermongers recommend them to their customers as being "bleeding new."

Of the habits of herrings but little is known. That herrings are gregarious there can be no doubt, as they are always found in shoals, which by fishermen are termed "schools." But nearly all fishes are gregarious, as are nearly all land animals and birds; even sharks are more or less so, unless it be the great white shark of the Atlantic Ocean. In the tank of an aquarium herrings form a pretty picture, as they always swim close together, and all in the

same direction. By some naturalists they are accounted migratory, but they cannot be termed so in the true and strict sense of the word. I do not believe they travel far, comparatively speaking, from the locality in which they are spawned and grow to maturity; and this, I think, is proved by the fact that certain varieties are always found, when found at all, in certain localities.

The herrings which are caught in Loch Fyne are different from those which are caught in the early autumn off Dimblington; while the small black-nosed "school" which appears off the Norfolk coast in October, can be easily distinguished from those which are caught upon Cromer Knowl, or the Dogger Bank. There is no necessity for them to go on a grand *tour* to or from the North Pole, and why, therefore, should they do so? In my opinion they go from deep to shallow water, and from shallow to deep water, according as the temperature of the water, and their supplies of food vary.

These two points, the supply of food, and the temperature of the water, should be carefully watched and studied by fishermen. It is well known that herrings are attracted towards the surface of the water by the moonlight—

"The herring loves the merry moonlight"

the old song says—but depend upon it the temperature of the water, coupled with the supply of food,

has more to do in determining the movements of a "school" of herrings than is generally believed.

Where do herrings spawn? when do herrings spawn? and how often do herrings spawn? are questions which, one would think, might be readily answered; but they have long exercised the attention of naturalists, and are yet far from being conclusively determined. The general opinion, based upon the statements of the older naturalists, and echoed by compilers of Natural Histories, is, that the herring approaches the shore *only* for the purpose of depositing its spawn, and that it *spawns but once a year*, from about the middle of September to the middle of November. In my opinion this theory is untenable. It is based upon the assumption that herrings spawn but *once* a year, and *only* in shallow water; an assumption which involves the still more marvellous assumption that every matured herring, or herring capable of spawning, must *annually leave the deep water and come close inshore for the purpose of reproducing its kind.* That shoals of herrings do make their appearance along our coasts during the latter summer and early autumn months, is an undoubted fact; and it is equally true that, at one particular period, nearly all the herrings caught are, what is called in the trade, "mazy"—that is, they are ripe for spawning, if not actually spawning. But spawning herrings are caught both near the shore and far out at sea at the self-same time; and shotten, full,

and "mazy" herrings are frequently caught together, often in the same fleet of nets, although in different proportions at different periods of the year. To my mind, these facts alone conclusively dispose of the theory that herrings approach the shore at certain times *solely for the purpose of spawning*. I do not take into consideration the *shallowness of the water*, for the simple reason, that north of Flamborough Head the water is thirty fathoms and more deep up to nearly the edge of the land.

Why then do herrings make their appearance off our coasts at periods which vary little from year to year? That is a pertinent question, and I will try to answer it. I have already called attention to the fact, that at the particular period when herrings appear off our coasts the waters along our shores teem with representatives of the medusan races; but to that statement I may add an important piece of evidence, which is, that the *medusæ appear before the herrings*. Another important fact bearing upon this subject is, that before and during spawning herrings do not seem to feed at all. Their bellies at that time are completely empty, and the common belief amongst fishermen is, that at that stage of their existence they "live by suction." These unlettered men have, without knowing it, hit upon the exact truth. Herrings, as well as other fishes, do at times "live by suction;" that is, they suck or draw from the water for their own nourishment those medusan organisms which,

though invisible to the naked eye, swarm around them. The sudden appearance of these swarms of medusæ in the waters round our coasts is, of course, just as much a mystery as is the sudden appearance of clouds of flies and gnats in the air on a summer's day. For these reasons I am of opinion that herrings do *not* approach our shores *simply for the purpose of spawning*, but in reality *in search of food.*

But the question—Where do herrings spawn?—yet remains unanswered. In my opinion herrings spawn wherever they may happen to be at the time they are ripe, whether they be in deep water, over a sand-bank, or near to the shore. The general idea is, that herrings deposit their spawn at the bottom of the sea; that the roes and milts there mingle together, and that the eggs glue themselves to the stones, shingle, or sand with which they first come in contact. To a certain extent this may be true, because the tenacity with which herring-spawn clings to any substance to which it has attached itself is something marvellous. But I am also of opinion that herring-spawn floats both below and at the surface of the water, that it vivifies there, and that there the eggs are hatched and the fry produced. Professor Särs, of the Christiania University, and other observers, have demonstrated that the ova of the cod, haddock, gurnard, mackerel, and other similar fishes, are hatched at or near to the surface of the water; but Professor Särs asserts, that whilst mackerel-spawn is

developed at the surface of the water, herring-spawn produces fry only at the bottom of the sea. His statement as to the development of surface-floating ova, made some fifteen years ago, was hailed as a marvellous discovery; but, as a matter of fact, he only verified and made public that which had long been known to practical fishermen. Whilst engaged in catching herrings that were "mazy," fishermen have observed the sea to be of a somewhat milky appearance; and, on drawing buckets full of the water on board, they have seen, not only that it contained herring-spawn, but that it was literally alive with herring-fry which had only just then burst into existence. These appearances, of themselves, would lead to the conclusion that herring-spawn vivifies and develops, not only at the bottom, but also at or near to the surface of the sea; because it would be unreasonable to suppose, if even it were not a physical impossibility, that these myriads of living atoms should with one common consent, at the very instant of their birth, soar some fifteen or twenty fathoms through dense water, in order, as it were, to get a first glimpse of the sun or moon, or stars, as the case might be. These facts too, entirely dispel the idea that herrings spawn only in shallow water near the shore, because the appearances to which I have referred were noticed far out at sea in deep water, and must have been naturally produced at the spot where they were observed. Indeed,

spawning is not the deliberate act which some naturalists would have one believe it to be. Herrings spawn involuntarily and gradually as they swim about, now here, now there; a process which greatly contributes to the commingling of the roe and milt, as well as to the distribution of the spawn itself. Upon this point, I may add, that some fishermen of great experience and intelligence, are of opinion—and it is one worthy of serious consideration—that all eggs which have been impregnated with the milt float, whilst those which have not been so vivified sink to the bottom of the sea, and there rot, unless devoured by some inhabitants of the deep.

The old notion that herrings spawned only in the autumn months and but once a year is now entirely exploded. That they spawn at least twice a year is certain, because both full and "mazy" herrings have been caught in the same waters in March, and again in August in the same year. Full and shotten herrings are caught along our coasts all through the spring, summer, and autumn months; and it is not improbable that herrings spawn all the year round. As a fact of some value bearing upon this point, I may here state, that a few days after Christmas, 1880, some men were "drawing" along the beach between Great Yarmouth and Caistor, when they caught two large herrings, one of which was full, while the other was shotten. I am inclined to believe, that with the exception of short periods after spawning to recuperate

their physical powers, herrings are continually either secreting spawn or spawning. These periods are undoubtedly short, because the recuperative powers of fishes are extraordinary. It is related, that in March, 1845, the Duke of Athole caught in the Tay a ten-pound salmon after it had spawned, and, that after attaching a medal to it he let it go free. The same fish was again caught within six weeks afterwards, when it weighed no less than twenty-one pounds, having more than doubled its weight in the interregnum. We may, I think, safely infer that the recuperative powers of the herring are proportionally equal to those of the salmon; and in support of the view that herrings are continually secreting spawn or spawning I may mention the fact, that matured herrings after once spawning are rarely, if ever, caught without having in them spawn sufficient to enable the observer to say whether it is a roe or a milt herring. I use the term "matured herrings" advisedly, because this question of maturity is one of some importance. Writers on piscicultural matters are very fond of using the adjective "immature," which really means "unripe" or "not perfect," as though it were a synonym for "small." What reasonable man will say a fish is "unripe," or "not perfect," simply because it is "small"? Maturity means, if it mean anything at all, a capacity for reproduction; and fishes, as well as animals and bipeds, arrive at maturity—that is,

are capable of reproducing their kind—before they are full grown. The salmon to which I have alluded as having been caught by the Duke of Athole, and then again put into the water, is a proof of this. The salmon had arrived at maturity, because it had spawned; but it was not full grown at the time it was first caught, because some six weeks after its first capture it had increased its weight by eleven pounds.

To my mind, it is absolutely necessary for the preservation of the herring, that it should be frequently spawning. The popular notion is, that no fishes are so prolific, and therefore none are so numerous, as the herring. But this notion, if herrings do not spawn frequently, is a fallacy. The fecundity of the herring, taken by itself, is prodigious, but, compared with that of some other fishes it is very small. The roe of an ordinary-sized herring contains about 33,000 eggs, which number is about the quantity there is in the roe of a smelt, and a little more than there is in that of a salmon. On the other hand, the roe of an ordinary-sized mackerel contains 500,000 eggs; that of a sole, 1,000,000; and that of a cod, 3,400,000. From an individual of the latter species, Leeuwenhoeck records taking no less than 9,344,000 eggs. If these figures be correct, and the surrounding circumstances the same, it follows, that for every herring there is in the sea there ought to be fifteen mackerel, thirty soles, and no

less than one hundred and two cod-fishes. I cannot, however, believe that there is such a disproportion as this; and in my opinion the numbers are more equalized, if not completely reversed, by the herring spawning more often than either the mackerel, the sole, or the cod. Herrings are a favourite food, at almost all stages of their existence, of fishes, birds, and mankind; and their destruction from these sources must be enormous—a destruction which, for the preservation of the species, necessitates on the part of the herring the possession of the most extraordinary fecund and recuperative powers. It is recorded that as many herrings as would fill a barrel have been taken from the stomach of a large rorqual *(Balænoptera rostrata)*; and Mr. James Wilson has calculated that the gannets or solan geese *(Pelecanus bassanus)* belonging to the island of St. Kilda alone consume at least 1,000,000 herrings per day. The Fishery Commissioners, in their report which was issued in 1879, estimate that 120,000 millions of herrings are annually destroyed by men, birds, and fishes, in the seas adjoining the United Kingdom; but that 1,200 billions of eggs are deposited in the same period. It must be borne in mind, however, that these figures are simply the results of calculations, the data for which were mere assumptions.

The period of time which elapses from the extrusion of the spawn to the hatching of the fry, is variously

estimated at from a few days to nine weeks. Judging from the most careful observations that have been made, the average period appears to be from three to four weeks. In my opinion the period depends greatly upon the season of the year, and the temperature of the water, as I believe that extreme cold retards the hatching, whilst moderate warmth facilitates it. This is true of the salmon, and why should it not also be true of the herring? It has been proved that salmon eggs deposited in September will ripen into life in ninety days, while those spawned in December require one hundred and forty days. The knowledge of this fact has enabled naturalists to send salmon-spawn in a healthy state to Australia, by simply packing it in ice. Upon this point I have a really startling piece of evidence. Mr. John Dixon, an intelligent Scotch fisherman, who is owner, as well as master of the fishing-boat "Dayspring," which belongs to Leith, and is numbered 770, has told me, that in the early part of March, 1876, he fished for herrings for some two or three weeks. The herrings he caught were full of spawn and spawning, and a considerable portion of the spawn, both of milt and roe, fell down to the bottom of the boat, between the large stones which were used as ballast. At the close of the herring fishing he did not clean out his boat, but put on the hatches, and went line-laying until about the middle of May. He then began to prepare

for the summer herring-fishing, and cleaned out his boat thoroughly. In doing so he removed all the ballast, and to his great surprise, between the large stones, he found a considerable quantity of herring-fry, fully developed, and strongly alive; to use his own words, "*their eyes were sparkling, and their tails were like feathers, and it was the bonniest sight I ever saw.*" This fry, therefore, must have been hatched in a period considerably less than eight weeks, and what makes the fact all the more remarkable is, that but little water could get to the spawn between the stones.

Opinions are pretty equally divided as to whether sprats are young herrings or not. Without going at length into this controversy, I may state that the external crucial point is, that the belly of the sprat is serrated in a most formidable manner; whilst the belly of the herring is quite smooth. Those who believe in the sprat being a young herring, leap over this difficulty by asserting that there is no difference, anatomically, between a sprat and a herring, and that the serrated belly of the sprat should be "*looked upon as we do the tucks of a child's frock; namely, as a provision for growth.*" Such reasoning does not commend itself to my mind. In the first place, there is a great difference in the anatomical structure of a sprat and that of a herring; the backbone of the former consisting of but forty-eight vertebræ, whilst in that of the latter there are fifty-six vertebræ. In

the second place, there is a very great difference externally in the appearance of a sprat and the appearance of a herring. The ventral fins are differently situated; those of the sprat are situated vertically under the first dorsal fin-ray, and have no axillary scales; whilst those of the herring are placed immediately beneath the centre part of the dorsal fin itself, and have axillary scales. The eye of the herring is also much larger proportionally than that of the sprat. A sprat, barring its serrated belly, is very much like a herring, in the same way that a cat is the counterpart of a tiger; but there the similarity ends. A sprat four and a half inches long is a very different fish to a young herring of the same length. The one, with its serrated belly, is perfectly formed as though it had arrived at maturity; the other, with its smooth belly, is thin and lanky, largest at the head, and tapering off to the tail. It has been denied that sprats in spawn have been caught; but fishermen and other capable persons of unimpeachable testimony assert the contrary. Dealers in sprats will pick out young herrings from amongst them, as readily as fishermen will pick out pilchards from amongst herrings. As a matter of fact, young herrings are frequently, and knowingly, sold to the unsuspecting public as sprats. I am entirely at one with those who contend that sprats are not young herrings.

How long a time is required for a herring to grow

to maturity, and to arrive at its full growth, has not yet been ascertained, and the wildest speculations thereon have been indulged in. According to some writers, seven years are required for a herring to arrive at its full growth. Knowing, as we do, that fishes grow at an exceedingly rapid rate—as is proved by the salmon which was caught by the Duke of Athole,—and that fishes mature long before they are full grown—as is proved by the fact that "tongues," that is, soles about five or six inches long, filled with roe, are frequently caught, we may, I think, reasonably infer that herrings arrive at maturity in a comparatively short period—I believe, well within twelve months,—and that, after once spawning, they rapidly develop to their full size. In the settlement of this question and other similar questions regarding fish-life, important service will be rendered to naturalists, and to the nation at large, by the aquaria which are now in working order. Except when spawning, herrings are voracious feeders, and in the matter of eating are not particular to a shade, devouring their own spawn, as well as fry of all kinds, the smaller crustacea, sand-eels, and worms. They may be caught with a hook; and a small sand-eel, or worm, is a good bait for them.

The size to which herrings attain, varies, of course, in varieties as well as in individuals. The smallest herrings are those which are caught off the Norfolk coast, and are known as "longshorers;" the largest

are those which are captured off the shores of Labrador. Very large herrings, too, are caught off the coast of Norway. The herrings caught in the North Sea off our eastern coasts range generally from ten to eleven inches in length, and, when full, weigh from four to six ounces; a full herring, eleven and a half inches long, will weigh eight ounces; a herring fourteen inches long, is a rarity, and when full, will weigh twelve ounces. The late Mr. William Utting, of Great Yarmouth, had a herring that was seventeen inches long; and Mr. George Balls, of the same place, has told me that he once caught one that measured the astonishing length of eighteen inches. I have seen hundreds of millions of herrings, and have always been on the look out for monsters in size, but I have never yet seen a herring that measured more than fifteen and a half inches in length. And that this is an extraordinary size is proved by the fact, that such a herring was caught in the year 1797, in the nets of the fishing-boat "Daniel and Mary," of Lowestoft, and was so exceptional a circumstance that it was deemed worthy of record.

Of all herrings the "longshorers" are the best eating; when perfectly fresh they are amongst the most delicious of morsels. Labrador herrings, like other large herrings, are anything but tempting to the palate, being, in the words of a Norfolk man in Canada, "*nasty, oily, coarse stuff.*" The herring is

universally believed to be a most nutritious food; but, according to Dr. J. S. Dodd—an eminent medical practitioner, who published his opinions in 1752—it forms a most valuable addition to the pharmacopœia. He says that herrings are "good for food in the plagues;" that the oil of herrings is "of excellent service in cramps and convulsions;" and that a high volatile cordial made from herring-bones is a most valuable febrifuge. His recipe for making this "cordial" is a curiosity worth preserving. Here it is:—"Take ten pounds of herring-bones, dried and grossly powdered; put them in a retort, lute it [make it air-tight], and place it in an open furnace; give it a degree of fire every two hours, till no fumes are seen in the receiver. Then let all cool, and there will be an oil, a volatile salt, and a pungent volatile spirit, which put in a clean retort, and by fire unite together. Then take eight ounces of this united spirit, and put into cucurbit [a gourd-shaped chemical vessel], with two pounds of rectified spirits of nitre, one pound of diaphoretic antimony, and four ounces of volatile salt of tartar; distil and cohobate [re-distil] so often till it is perfectly united; then add an ounce of oil of nutmeg, and half an ounce of oil of cinnamon; digest in a matrass [an egg-shaped chemical vessel] ten days, and pour off for use, which keep in a well-stopt bottle; the dose of this is from four to ten drops, whenever a high volatile cordial is necessary."

CHAPTER III.

The Herring Fishery.

Origin of the fishery—The Romans—Garianonum—The Saxons—Cerdick-shore—Foundation of Great Yarmouth—Monasteries of Barking and Evesham—"Herring-silver"—Yarmouth in the eleventh century—Hugh de Montford—Abbey of St. Edmond—Origin of the celebrated "Free Fair"—Herrings a prime article of food—Herring fair at Fécamp—Fishermen's chapel at Yarmouth—The Free Fair in the twelfth century—The king's provost—Fishing in the Danish Sound, the Baltic, the Meuse, and off Scotland—Dunwich a free burgh—Alexander Neckham and his eulogy of the herring—The fishery in the thirteenth century—Abbey of Connal—King John's charter to Yarmouth—The Cinque Port bailiffs—Peter Chivalier—Who first salted herrings?—Salted herrings at Liege and Estampes—Salt-works at Bremen, Gorleston, and Dieppe—"Lenten stuffe" at Yarmouth—Salted fish in Scotland—Salt known to the ancients — Captain Cook and the South Sea Islanders — Captain Ross and the Esquimaux—Abbot of St. Albans—Value of horses—Monks of Meaux or Melsa—War between the Danes and Hanse towns—Herrings the food of kings and peasants—Price of herrings—The fishing off Norway—Rude manner of enforcing payment—Arbitrary arrest of Zealanders—The fishery during the fourteenth century—Great Yarmouth the grand emporium for herrings—Tolls, and exemptions therefrom—Abbot of Croyland—Monks of Tutterney—Merchants of Lynn—Dues upon herrings and ships—Commerce in herrings prohibited within seven miles of the Free Fair—Supply of herrings to the king—The free-trade policy of England—Magna Charta—

Importance of the Free Fair—Naval parliament—Great Yarmouth the greatest seaport in England—War between Denmark and the Hanse towns—Fish-houses—The famous "Statute of Herrings"—Value of money—When were herrings first smoked?—A chimney a great luxury—Charter to dig for coal—The "Windsor herrings"—Rigorous enforcement of charter rights—Value of salt—The fishing off the French and English coasts—Pirates—George Benkel—The Dutch "cure of herrings"—The fishery during the fifteenth and sixteenth centuries—Free trade and protection — Mediterranean trade with Scotland — Dues in Scotland — Fishery convention — A member of parliament paid his wages in herrings — War between Scotland and Holland—The Free Fair at Great Yarmouth—Cardinal Wolsey—Sunday trading—Cupidity of the Yarmouth Corporation—Fishermen convoyed by men-of-war, and exempted from impressment—Special licences granted to ale-houses—Great Yarmouth in 1580—Value of the fishing—Prices of herrings—The Dutch in 1600—Yearly value of the North Sea fishery—The fishery during the seventeenth century—Yarmouth haven and "that useless cathedral in Norwich"—Reversal of the free-trade policy of England—Decline of the English fishing—Prices of herrings—Foreigners prohibited from fishing off the English coasts—Dimensions and cost of an English buss and fishing gear — Gauging herrings—Salt-works—Foreigners prohibited from selling herrings in England—Price of herrings—The Scottish fishing—Visit of Charles II. to Great Yarmouth—Special enactments in favour of fishermen—The protection policy of the Government and the ordinances of the Yarmouth Corporation—Litigation between Great Yarmouth and Lowestoft —"Heyning money"—"Tide price"—The fair no longer free—Its decline—John Andrews—The Yarmouth Corporation checkmated—"Christ's half-dole"—The vicars of Lowestoft and Great Yarmouth—Proper psalms and lessons for use during the herring season—Besprinkling fishing-boats with holy water—Blessing the sea at Boulogne—The fishery during the eighteenth century—The fishery a nursery for seamen—War between France and Holland—Immense shoals of herrings off Scotland—Efforts to resuscitate the Free Fair—French and Dutch fishermen—The cure and export of herrings at Great Yarmouth and Lowestoft—Yarmouth and Lowestoft luggers—North-country cobles and West-country boats—Curing-houses in

Scotland and the Isle of Man—Insurance premiums during the great war—Bounties to fishermen—The Scotch and Swedish fisheries—Fishing-boat lights—Herrings packed in ice—Prices of herrings—The fishery during the present century—The Scotch the greatest herring-fishers—Deliveries at Great Yarmouth and Lowestoft—Annual catch in the North Sea—The fishery a huge lottery—Enormous catches of herrings—Prices of herrings—Meaning of the word "last"—The Yarmouth bloater and the Newcastle kipper—Herring-nets—Invention of the herring-net loom—Enormous quantities of nets.

THE history of the herring fishery is interwoven inextricably with the history of Great Yarmouth. The fishing for herrings originated undoubtedly along the shores of this part of the Eastern Coast, and was carried on ages before the rude historians of our island home deemed anything worthy of record beyond battles, and individual feats of arms. The Romans, we are told, looked upon the herring as a dainty dish, and their knowledge of it is believed to have been obtained from their soldiers, who were stationed on the Eastern Coast at a mural encampment called *Garianonum*, that is, "the mouth of the Yare." The remains of this encampment are still in a splendid state of preservation, and are well worthy a visit. They are situated about four miles S. W. and by W. from Great Yarmouth, in the village of Burgh Castle. The word *burgh* in Saxon signifies a fortified place.

About the commencement of the Christian era, the sandbank upon which Great Yarmouth now stands began to appear above the sea; it rapidly increased

in extent and raised its level, and, during the latter part of the occupation of this island by the Romans, fishermen annually resorted to it for two important reasons—because the Roman garrison, which was near to it, afforded them protection from pirates; and because this garrison, and its masters and friends, were good customers to them for the herrings which they caught.

After the retirement of the Romans in the early part of the fifth century, and the advent of the Saxons, we may readily believe, from the Saxons being a maritime people, that the fishing for herrings was not suffered to lapse. Hence it is supposed that the landing of Cerdick the Saxon, with Cenrick, his son, and the crews of five ships in the year 495 upon this sandbank, gave fresh impetus to the herring fishery, as well as the name of Cerdick-shore to the bank itself. Certain it is, that early in the sixth century the Saxons built a stronghold there, and thus commenced the foundation of Yarmouth.

Incidental notices of the use of herrings as provisions during the Heptarchy are very rare; but, bearing in mind the profound ignorance of the times, this sparseness of information not only proves the truthfulness of these notices, but enhances their value. The annals of the monastery of Barking in Essex, which was founded in 670, inform us that a tax was then levied upon herrings, and was known as "herring-silver." In the records of the monastery

of Evesham, which was founded in 709, there are several references to the herring fishery; and the value of this fact is greatly enhanced by the monastery having been situated in the midland county of Worcestershire, rather than at some place contiguous to the eastern coast. These notices prove that herrings in those days were widely used, and highly valued as food; and we may reasonably infer that such supplies were drawn from Yarmouth, or its immediate vicinity, because, no sooner did the nation take note of its position, and record the result of its stock-taking in *Domesday Book*, than we find that Yarmouth was a place of very considerable importance, and that such importance was due to its herring fishery. From the same national record we also learn, that at that time the manors in Suffolk belonging to Hugh de Montford yielded numerous rents of herrings; and that the manor of Beccles, which is situated but a few miles from Yarmouth, paid an annual tribute of 30,000 herrings to the Abbey of St. Edmond. In the days of William the Conqueror the number was increased to 60,000. Yarmouth was not built in a day any more than Rome was; and it is, therefore, reasonable to conclude that as the sandbank known as Cerdick-shore became larger, and more safe to dwell upon, fishermen from all parts took up their permanent residence there, and so originated the town of Yarmouth.

In the time of Edward the Confessor, who began to reign in 1041, Yarmouth was a burgh with no less than seventy burgesses, or merchant traders, who, of course, represented a large population. It also possessed a church, which was dedicated to St. Bennet, and which, ecclesiastical authorities say, was founded in the seventh century by Bishop Felix. This prosperity was due to its herring fishery, and its Free Fair; the former being prosecuted, and the latter being attended, by not only our own countrymen from various parts of the island, but also by fishermen from France, Normandy, Flanders, and Holland, all of whom brought products from their own countries for sale or barter, as well as the herrings which they caught off this coast. When this herring fair was first held it is impossible to say, but we may readily imagine how such a market came to be established, when it is remembered that from time immemorial, shoals of herrings have annually, during the autumn months, appeared close off the coasts of Norfolk and Suffolk. Various writers affirm that, during the ninth and tenth centuries, the nations whose countries are washed by the North Sea prosecuted the herring fishery, and that there was a wide-spread traffic in fish. And this is not to be wondered at when it is borne in mind that, in those barbarous ages, the supply of food was exceedingly precarious; that it was much easier and safer to convey merchandize by sea than by land; and

that, in consequence of the number of fast days, fish as an article of food was almost always at a premium.

This Free Fair, so called from its being free to everyone, lasted for forty days—between Michaelmas (September 29th) and Martinmas (November 11th)—and was regulated by the fishermen and merchants who resorted to it until 1067, or thereabouts, when the barons of the Cinque Ports appointed bailiffs to govern it. By this time the value of the herring fishery, and the advantages of a herring fair were so well known, not only to our own countrymen, but also to foreigners, that in the year 1088, the Duke of Normandy granted to the Abbey of the Holy Trinity at Fécamp, the right to hold there a fair during the prosecution of the herring fishery. This fair, however, did not in any way interfere with the herring fishery at Yarmouth, which, as an old writer says, continued to be "the noblest fishery for herrings in Europe." The importance of it at this time may be judged from the fact, that in the reign of William Rufus (William II.), who was crowned in 1087, William Herbert de Losinga, the Bishop of Norwich, built upon the sand there a chapel, and placed therein a "godly minister," whose duty it was "to say divine service therein, and to pray for the health and prosperous success of the fishermen that come to fish at Yarmouth in the herring season." Some historians are of opinion that Losinga did not

build a chapel as is here stated, but that he restored the church of St. Bennet, to which I have already referred. When, however, the bailiffs from the Cinque Ports came as usual to exercise their authority at the Free Fair, they brought their own priest with them, and removed and expelled the bishop's priest. Thereupon the bishop complained to the king, who overruled the bailiffs, and restored the bishop's priest to his place. Manship, who wrote in 1619, says that this chapel was built "about half a mile northward from the place where the great church now standeth," and that in his time the ruins of it were yet to be seen. Subsequently, this same William Herbert de Losinga built the great or parish church, and dedicated it to St. Nicholas, who was the patron saint of fishermen; and Spelman informs us that this "very illustrious church was enriched and endowed with fishermen's offerings."

In 1109, Henry I.—owing, as Swinden says, to the "constant increase of the inhabitants at Yarmouth, and the great concourse of fishermen, traders, and merchants, from many parts of England, Flanders, and Normandy, on account of the vast quantity of lenten provision manufactured there annually"—appointed a provost or chief magistrate, whose duty it was to "collect the King's customs," and to "execute justice in the King's Majesty's name." This patent officer continued to exercise his functions for

nearly one hundred years. That part of the town where the provost had his office, if not his residence, is still known as "The Conge." In olden times it was called "The King's Conge"—literally, "The King's leave or licence."

Various records prove how important and widespread the herring fishery had become in the twelfth century. Early in the century, immense quantities of herrings were caught in the Danish Sound; and in 1124 they were exceedingly plentiful in the Baltic along the shores of Pomerania. That they were greatly valued in Scotland is proved by a charter which was granted by King David I. to the Abbey of Holyrood in 1138, and which included the right "to fish herrings at Renfrew." In 1163 large quantities of herrings were caught in the river Meuse; and in 1199 Dunwich was erected into a free burgh on payment, amongst other items, of an annual tax of 2,400 herrings.

About the latter end of this century, the celebrated friar, Alexander Neckham, sang, with evident gusto, the praises of the herring. Neckham was prior of the Augustinians at Exeter, and died in 1227. His pæan on the herring forms part of his *De laudibus divinæ sapientiæ*, which is preserved in Holl's edition (p. 405). For the following free, but clever and amusing translation of it, as well as for other interesting information which this book contains, I am indebted

to a friend whose ability is only exceeded by his modesty:—

"The herring—who finds in the shining waves
Board, lodging, and washing free—
Though small is, of all kind Neptune's gifts,
The sweetest by far to me.
He wanders about, through the roaring main,
With his sisters, and cousins, and aunts,
In shoals so tremendous, to count 'em were vain,
And what's more—nobody wants.
He wont make you squeamish when recently caught,
And is not to be sneezed at when high-cured and 'saut;'
On the table of Dives he's lavishly spread,
And sweetens for Hodge his poor crust of dry bread.
For this bounteous gift dear old Ocean we thank,
And draughts e'en miraculous draw on his bank."

From the very commencement of the thirteenth century we have the most irrefragable proofs of the cosmopolitan, not to say national, importance of the herring fishery. In 1202 this fishery was prosecuted off the coast of Ireland, as is shown by a charter of that year which confirmed a donation of herrings to the Abbey of Connal. And in 1209 King John, being straitened for a navy to recover the kingdom of Normandy which he had lost, granted a most important charter to Yarmouth, on condition that the burgesses should pay an annual fee-farm rent of £55 for ever, and should "provide the king with fifty-seven ships for forty days at their own charge, as often as the wars he was engaged in should give him occasion to demand them." This latter fact proves

beyond all doubt how important Yarmouth had become as a fishing station, because the number of ships which she undertook to supply was the same number that the celebrated Cinque Ports had to contribute altogether. The privileges conferred by this charter were of so valuable a nature, that the breach of them was punishable with death. No sooner, however, were the burgesses so invested, than, according to Swinden, "their western and southern neighbours, inhabitants of Little Yarmouth and Gorleston, alarmed at such ample acquisitions, and dreading their future power, began to attack them in their very vitals, and to wrest, if possible, some of their customs and franchises from them." These feuds resulted in expensive and protracted suits and litigations, which were not finally determined in favour of the burgesses of Yarmouth until the year 1332. Amongst other immunities and privileges with which this charter invested the burgesses was the power to appoint their own bailiffs or chief magistrates. The word "bailiffs" in those days signified "lessees of the king." And, inasmuch as their newly-acquired liberties interfered with the liberties of the barons of the Cinque Ports, there arose, respecting the management of the Free Fair, frequent and violent disputes which caused, not only the expenditure of large sums of money, but much bloodshed. These disputes forcibly illustrate the unwisdom of permitting two bodies of men, utterly

independent of each other, to possess concurrent jurisdiction in any matter. The barons of the Cinque Ports at first sent as many as eight bailiffs to the Free Fair, but the number gradually dwindled down to two, until, in the reign of Charles II., they ceased altogether to trouble the authorities of Great Yarmouth with their presence.

About this time it is said that the curing of herrings with salt was discovered by a Yarmouth merchant named Peter Chivalier; and this claim is supported by the statements that a patent was granted to him, and that subsequently, for a sum of twenty marks, or about £200 of our money, a licence was granted to one Peter de Ferars to salt herrings according to Chivalier's method. But these facts prove nothing except that Chivalier had, what he believed to be, the best method of salting herrings; just as in the present day fish-merchants, actuated by a commercial spirit of rivalry, assert that they produce better bloaters than their neighbours, and that they alone impart the true ham flavor to red-herrings. The naked fact is that no one knows who it was who first preserved herrings by curing them with salt, any more than any one knows who it was who invented the herring-net, or who it was who first caught herrings. Let me, however, do justice to this departed worthy. It may be that Chivalier was the first to adopt the plan of dry-salting herrings at sea as soon as they were caught, or he may have

cured them with salt in some other than the then ordinary manner; but to say that he first used salt for the curing of herrings, is to say that which is contrary to common sense, and to all the known facts of the case. Herrings were cured by means of salt hundreds of years before this period, or they could not have been so widely used as they were for human food. In 1187 a charter was granted by Philip II., king of the Romans, to the town of Liege, by which the inhabitants were granted the privilege of dealing both in fresh and *salted* herrings. In 1155 Louis VII. of France prohibited his subjects from purchasing anything but mackerel and *salted* herrings at Estampes. In 1054 there was a fishing for herrings twice a year off the coast of Denmark, and those engaged in it carried on a trade with Bremen for *salt*. In 1041 there were three *saltpans* at Gorleston next Yarmouth; whilst a charter that was granted in 1030 to the Abbey of St. Catherine, which was situated near Rouen, informs us that there were then close to Dieppe certain *salt-works* which annually paid to the Abbey a tax of five milliers of herrings. According to the oldest and most reliable historians, the Free Fair at Yarmouth was held "from time immemorial for the trimming, and *salting*, and selling of herrings," and for the manufacture of "lenten stuffe;" the said "lenten stuffe" being manufactured in the autumn, but not eaten until the following spring. It is also recorded, that in the tenth century the Scots exported

herrings to the Netherlands; and that Inverlochy was then a town to which our continental neighbours resorted for the purchasing of *salted* fish. These facts speak for themselves. But it must not be forgotten that salt was known to, and used by, the ancients, if not by the antediluvians. Christ himself testifies to its preservative qualities. Moses strictly enjoined Aaron and his sons to "season with salt" their meat offerings to the Lord; and amongst the Bible stories that were photographed upon our infantile imaginations, not one is more vivid and thrilling than that of Lot's wife looking back upon Sodom and Gomorrah, and being turned instantly into a "pillar of salt." I am one of those who believe that when God gave man "dominion over the fish of the sea, and over the fowl of the air, and over the cattle," that He at the same time implanted within him the knowledge necessary for the exercising of such dominion, and for his profiting thereby. Indeed, were this not so, man in a state of nature would have been absolutely impotent and helpless. It may be that this intuitive knowledge is none other than that *invention* of which we are told *necessity is the mother*. Certain, however, it is that such knowledge is spread over the whole earth, and is possessed by races of men the most widely separated from each other, and amongst the lowest in the scale of humanity. Captain Cook, when he discovered the South Sea Islanders, found that they seasoned their

food with salt-water, which they sipped from cocoa-nut shells whilst they were eating; and Captain Ross in January, 1830, when entombed in the arctic regions, discovered a tribe of Esquimaux who were so provident, that they kept by them for future use a store of seal and reindeer which they had preserved in the snow. But to return.

About the year 1230 the Abbot of St. Albans was a large dealer in herrings. During the Free Fair his agents bought great quantities of herrings, which were stored at Yarmouth in a house for which the Abbot gave fifty marks, or about £500 of our money; and there they remained until they were re-sold to, as we are told, the "inestimable advantage as well as honour of his abbey." We are also told that for the carting of his herrings the Abbot employed seven stout and handsome horses, and some idea of the difference in the value of money between then and now may be drawn from the fact, that each of these stout and handsome horses was valued at only 30s. These animals were, of course, pack-horses; chargers suitable for knights-errant were very valuable, as we learn from the fact that, in 1207, a great baron named Amphitil Till agreed to pay King John, as part of his ransom, ten horses, each worth thirty marks, or about £300 of our money.

In 1236 such immense quantities of herrings were caught in the Baltic, off the German coasts, that they were boiled down simply for their oil. In 1240

both fresh and dried herrings are referred to in the Scottish Parliamentary Records; and in the same year William de Fortibus, Earl of Albemarle, granted to the monks of Meaux, or Melsa, near Hull, half an acre of land for the erection of storehouses for their herrings and other fish. In 1242 a war broke out between the Danes and the inhabitants of the Hanse towns, owing to disputes as to the right of fishing for herrings off the Danish coasts.

That herrings were a favourite food of all classes of society in the thirteenth and fourteenth centuries is proved by the following facts:—In 1242 King Henry III. purchased of the "men of Yarmouth," for distribution in alms, herrings to the value of £50, a sum of money equal in the present day to £750. In 1272 there was a ferry near the Priory of St. Olave, in Suffolk, which was kept by one Sireck, a fisherman, who was paid for his trouble in bread and herrings. In 1286 Edward I. granted a charter for thirty acres of land at Carlton in Suffolk, the annual service for which was the delivery of twenty-four pasties of fresh herrings at their first coming in. From the wardrobe accounts of the same king we learn that, in the year 1300, 18,500 herrings were provided for the castle of Stirling; and that forty lasts of red-herrings were obtained from Great Yarmouth for the use of the king. In 1302 thirty-two lasts were "bought for the king's household of

the bailiffs of Great Yarmouth" at four marks a last; and in the following year, fifty lasts were purchased at the same price. In 1304, forty lasts were bought for 46s. 8d. per last, and the freight for taking these to London was 2s. 9d. per last. At the marriage of Margaret, daughter of Edward I., to the Duke of Brabant, there were provided amongst other good things for the victualling of the ships which conveyed the royal couple to the Continent, 10,652 herrings. And, from the Northumberland Family Book we learn that, amongst other viands which were provided for the breakfast of the Earl and his Countess, were ten herrings or a dish of sprats.

From a complaint that was made by the people of Grimsby, we learn that in 1291 the value of herrings varied from 20s. to 40s. per last; and that the herring fishery was prosecuted off the coasts of Norway is proved by the fact, that in 1294 the English were admitted to the same privileges in going to that country for herrings as were enjoyed by the natives of the Hanse towns.

In those days payment for goods supplied to a foreigner was enforced in a very rude and unjust manner. If a stranger failed to liquidate his debt on demand, he was at once arrested; in the event of his escaping, application for the amount was made to the authorities of the place where the defaulter resided, and, if the money were not paid, or the debtor not committed to prison, then the next

ship and goods of any inhabitant of the town to which the defaulter belonged which came within the liberties of Yarmouth, were seized and sold in satisfaction of the debt. Thus we read that in 1284 John Gerbege arrested certain men of Ostend for a debt of £4 1s.; and in 1299 twelve Zealanders, or natives of Holland, were arrested at the Yarmouth herring fair, and committed to prison, in consequence of four other Zealanders, with others unknown, having stolen a ship belonging to a servant of the king, named Nicholas Montpeliers.

During the fourteenth century Great Yarmouth—the prefix "Great" was first used in the reign of Henry III.—reached the very zenith of its prosperity as the grand emporium for herrings, and the centre of the herring fishery. Monasteries and other religious houses were largely supplied with cured herrings from Great Yarmouth, and, as such sanctuaries were exempted by special charters from the payment of toll, no dues in such cases were charged, or if charged, they were remitted. *Toll*, or *thol*, is a Saxon word, and signified a payment in markets or fairs upon goods bought and sold. Thus we find that in 1306 the tolls upon eight lasts and one thousand herrings, which had been purchased by the Abbot of Croyland, and the dues upon five lasts of herrings belonging to the monks of Tutterney, were remitted. In 1320 the bailiffs of Yarmouth levied a distress on some merchants belonging to Lynn for

tolls which they had neglected to pay, but it being shown that the burgesses of that place were exempted by charter from such dues, the amount of the distress was returned. To prevent such mistakes, however, the usual practice was for the burgesses of other towns, and the friars and monks of religious communities, possessing these privileges, at their first coming to Great Yarmouth to trade, to produce duly sealed testimonies of their charters, and these were entered upon the court rolls as evidence of their being free from toll or other custom.

In 1327 various charges were made for erecting and maintaining the walls at Great Yarmouth, and amongst them were,—2d. per last upon imported herrings, 4d. per last upon exported herrings, 6d. for every alien ship, and for all sorts of merchandize 1d. per pound's worth. In 1337 it was enacted that "the buying and selling of herrings to be at Great Yarmouth only, and not elsewhere within seven miles of the port or town of Great Yarmouth during the fair." In 1338 forty lasts of herrings, and in 1358 sixty lasts of herrings, were supplied to the king for the use of his army and navy in France.

At this period the Free Fair at Great Yarmouth had assumed enormous dimensions; and this prosperity was due to the free-trade principles by which it was governed. Whilst other states were hampering the herring fishery and the herring trade

with protectionist legislation, England was fostering both the one and the other by permitting absolute freedom, both to buy and to sell—a policy which was attended with the most beneficial results. A provision in *Magna Charta* enacted that "all merchants may, with safety and security, go out of England, and come into England, and stay and pass through England, by land and water, to buy and to sell, without any evil tolls, paying the ancient and rightful dues, except in time of war." At the Free Fair, not only were herrings bought and sold or bartered, but other goods as well; and owing to this circumstance the herring fishery was commenced at an earlier period than usual. Thus we find that in the first week of August, 1343, Thomas Botiman, of Newport, brought into the haven six and a half lasts of herrings, for which and for his vessel he paid 1s. 7d.; whilst Adam Brangwayn, for his ship, and for four and a half lasts of herrings, paid in the same proportion. In the middle of September of the same year, ten fishers from Cornwall imported great quantities of cloth, for which they paid a toll of 1d. for every 20s. worth; and at the latter end of this month, in the course of five days, no fewer than sixty foreign fishing-boats, of which ten were from Lombardy in Italy, entered the haven and paid 6d. each; hence, as Swinden says, "we may conceive the great multitudes of fishermen from foreign parts that annually came hither to fish for

herrings in the time of the Fair." In the second week in August, 1344, John Sys, of Lombardy, imported, in his ship called the "Haghlere," two lasts of herrings; and, at the latter end of this month, John Lop de Blankeburgh imported, in his ship called "La Godyere," three lasts of herrings. Commenting upon these facts Swinden says:—"One principal reason why fishermen came so soon, was to barter their commodities brought with them from their own countries with others; this drew together a multitude of people from all parts, so that the haven was scarce big enough to contain their shipping."

In 1344 Great Yarmouth possessed as many as two hundred and fifty fishing-boats; and her importance as a maritime place is still further magnified by the Naval Parliament which was held during that year. Edward III. was desirous to have an exact account of the state of the shipping in his kingdom, and for this purpose he commanded every seaport to send a certain number of commissioners to London. From the proceedings of this Naval Parliament, as well as from other evidence, it appears that Great Yarmouth possessed more shipping, at that time, than any other port in England, with the exception of London. London and Great Yarmouth were each required to send four commissioners, while Bristol, Newcastle, and other great trading towns were required to send only two, and some only one,

each. Indeed, three years later, Great Yarmouth supplied His Majesty with more mariners than any seaport in England; because we learn from the "Roll of the huge fleet of Edward III. before Calais," which is extant in the Public Record Office in London, that, in the year 1347, at the taking of Calais, Great Yarmouth assisted the king with forty-three ships, on board of which were one thousand and seventy-five mariners, which was a larger number than even London supplied. The value of the free-trade policy of England was again exemplified in 1348, when, for the second time, war broke out between the Danes and the inhabitants of the Hanse towns, respecting the right to fish for herrings off the coast of Denmark.

About this period we know that houses, specially adapted for the purpose, were used for the curing of herrings, because, in 1349, wills were made by Alice Cristion, Simon de Stalham, Anselm de Fordele, and Isabel de Fordele, in which special mention is made of *fish-houses;* one of them, indeed, is called *the black-house*, which may indicate that it was used for the curing of a special description of high-dried herrings, which to this day are known as *black herrings.*

In 1357 the famous act of parliament known as the "Statute of Herrings" was enacted—an act which shows how anxious the legislature was to foster and promote the herring fishery. The principal

provisions of this act were:—That all herrings should be bought and sold in the haven of Great Yarmouth, and not at sea, or elsewhere within seven miles of the port of Great Yarmouth, during the Fair; that the fishers should be free to sell their herrings, and to buy their victuals, to or of whomsoever they pleased; that the fishers should not sell a last of full fresh herrings at a higher price than 40s., and that they should sell two lasts of fresh shotten herrings at the price of one last of fresh full herrings; that all sales should be made between sun-rise and sun-set; that the hundred of herrings should be counted as six score, and the last as 10,000; that the merchants of Yarmouth and London, or elsewhere, should sell the thousand of herring to the people after the rate of the price of the last; that the people of Yarmouth should sell the last of red-herring, bought for 40s. fresh, within forty days, for half a mark of gain, and not above; that the people of London should convey the last of herring from Yarmouth to London for one mark of gain, and not above; and that two lasts of shotten red-herrings should be sold one mark dearer than a last of full red-herrings, "because the curage of the last of shotten herrings draweth to as much as the last of full herrings." In view of the free-trade policy by which the herring fair at Great Yarmouth was governed, it seems strange

that any legal restriction should have been placed upon the price of herrings; but it must be borne in mind that in those days 40s. was equivalent to £30 of our present money, and that such a sum is even now a very large wholesale price indeed, for a last of herrings of the best description and of the primest quality. A mark was 13s. 4d., and was equivalent to £10 in the present day. This restraint upon trade did not long remain in force, as in 1362 the legislature decreed that herrings should be bought and sold openly and freely, but hampering the privilege with the condition that no man should interfere between a buyer and a seller whilst the two were bargaining. The advantages of a sale by roup or public auction were then unknown.

This remarkable act of parliament gives us a wonderful insight into the herring trade of that period; it proves that the difference in quality between full and shotten herrings was then well understood and appreciated, and that the curing of herrings, both with salt and with smoke, had been long practised. The term *red-herring*, which is used in the statute, signifies a herring that has been first cured with salt, and then has been dried and coloured by means of heat and the smoke from burning wood. It is believed that at this time no red-herrings were "manufactured," except at Great Yarmouth. When it was that herrings were first cured with smoke it is impossible to say; but

we may readily believe that it was from "time immemorial," for the simple reason that before the thirteenth century such household conveniences as chimneys were unknown in England. In the year 1200 one chimney only was allowed in a religious house, one in a manor-house, and one in the great hall of a castle or lord's house. In the cabins and huts of the poor the smoke had to find its way out of the *Rere Desse*—which was the kitchen and dining-room combined—as it best could. From the earliest ages, therefore, the value of smoke from burning wood for the preservation of flesh of all kinds must have been forced upon the notice of the inhabitants. A coal fire at that time was a luxury unknown; for it was Henry III., who reigned from 1216 to 1272, who first granted to the inhabitants of Newcastle a charter or license to dig for coal.

In 1362 the burgesses of Great Yarmouth made an annual grant of "one last of red-herrings, dried and well cleansed," to the authorities of the free chapel of St. George at Windsor; but whether it was a free gift and a sign of the prosperity of the fishery, or whether it was a fine imposed upon the town in consequence of the murder of a Cinque Port bailiff, cannot now be determined. In 1652 the grant of these "Windsor herrings," as they were called, was purchased by one Colonel Sparrow, as an annuity. Subsequently it was commuted for

a yearly payment, at first of £10, and then of £8; but eventually the payment entirely lapsed.

The importance of the charters granted to Great Yarmouth, and the rigour with which they were enforced are proved by the facts, that in 1368 one John Lauwes was hung for having exported seven sacks of wool without having paid the dues thereon; and that, in 1373, John Botile and others, of Lowestoft, were heavily fined for having bought of one John Trample of Ostend, an alien, in Kirkley road, twenty-five lasts of herrings of the value of £50, or about £750 of our money.

That salt was very valuable at this period is proved by the facts, that in 1379 one Thomas Cobald, by will, gave to the high altar of the church of St. Nicholas at Great Yarmouth, amongst other things, a "wey of salt;" and that, in 1382, one William de Rookhaghe bequeathed thereto "three weys of salt, gross." A wey of salt consisted of forty water-bushels; and a water-bushel, or five pecks, of salt was estimated to cure a barrel of herrings. So late as the seventeenth century a wey of salt was valued at 40s.

In 1383 herrings in considerable quantities were caught off the French coast, near to St. Valery-en-Caux; and, in 1394, large shoals of herrings were seen off Whitby, a forerunner of the fishing which in recent years has been prosecuted with great success off Dimblington. About this time fishermen

were frequently attacked and injured by Danish and other pirates, and accordingly, in 1395, Great Yarmouth, Norwich, and other towns on the Norfolk coast, jointly fitted out a number of vessels for their protection.

In the year 1397 there died one George or William Benkel or Benkelen, otherwise Beukelz or Beukelsen, a Dutchman, whose memory is held in great veneration by his countrymen, and to whose tomb royal and imperial visits have been paid. This worthy was born at Biervlet, near Sluys; in an old manuscript he is described as having been a "barreler of herrings," and to him is attributed the having instituted what is known as the "Dutch cure of herrings." To this very superior method of curing herrings, which was long kept a profound secret, may be ascribed the marvellous success and prodigious extension of the Dutch herring fishery during the fifteenth, sixteenth, and seventeenth centuries. It is an absolute requirement of this method that the herrings should be cured at sea immediately after they are caught. When shaken out of the nets, they are at once gutted, the gills and stomach only, however, being removed. After being sprinkled with salt and rouzed—that is, turned over and over, in order that the salt may be equally distributed amongst them,—they are sorted according to quality, and are then packed head to tail in barrels. Each layer is sprinkled with salt, and the layers are placed

alternatively across each other. Special attention is paid to the quality of the salt which is used, and the barrels, after being headed up and made air-tight, are marked with the date when the herrings were caught.

From this period the notices respecting the herring fishery multiply greatly. It would, however, be tedious and uninteresting to refer to them in minute detail, and I shall therefore call attention to only the more salient facts. During the fifteenth and sixteenth centuries the fishing for herrings was carried on with great and increasing vigour and success, not only in all parts of the North Sea, but also in the Scottish lochs, the Norway fiords, the Danish Sound, the Baltic, the Zuyder Zee, and the eastern half of the English Channel. With all nations, however, except England, the policy of protection was an article of faith.

In 1415 foreigners were prohibited from fishing off the coasts of Norway; and, about the same time, the Scots enforced their claim to the exclusive right of fishing off their own coasts. Herrings were then very plentiful off Inverness, and in Loch Fyne; and at the mouths of the Dee, the Tay, and the Tweed immense quantities were captured. These were salted and smoked, and disposed of principally to foreigners, who, we are told, took them "in the time of Lent through the Mediterranean Seas, and there sold them to their great profit and winning." The

dues levied by James I. of Scotland, in 1424, were one penny per thousand upon fresh herrings, and fourpence per thousand upon those that were cured.

In the early part of the fifteenth century frequent quarrels took place between fishermen at sea, owing to their trespassing in each others waters; but, in 1468, the French, Dutch, and other nations mutually agreed by treaty not to molest each other's fishermen.

In 1464 a cade, or barrel, of herrings was taken by way of composition for the wages of one of the burgesses who represented Dunwich in parliament. A "cade of herrings" was 500; but in reality it consisted of 600, because, as I have already shown, the "Statute of Herrings" enacted "that the hundred of herrings should be counted as six score."

In 1471 the Scottish king encouraged his subjects to build large fishing vessels in imitation of the Dutch "busses," which were vessels from eighty to one hundred tons burthen; and in 1491 it was enacted that no vessels under twenty tons burthen should prosecute the herring fishery. Strangers, also, were permitted to buy only salted herrings in barrels, and not even those until the wants of the inhabitants of stern Caledonia had been first supplied. And from 1532 to 1541 a war, which caused much bloodshed and damage to property, was waged between Scotland and Holland, because King James V. refused to allow the Dutch to fish for herrings off the Scottish coasts.

The policy of England was widely different. From the end of the fourteenth century to the commencement of the seventeenth century, the various governments of the day vied with each other in protecting the herring fishery, and in fostering the herring trade. Hence, during this period, the Free Fair at Great Yarmouth was annually attended by an increasing number of fishermen and merchants from all parts of England and the Continent. And that herrings, both fresh and cured, were becoming more and more a common article of food, may be inferred from the fact, that in 1525 Cardinal Wolsey gave to each of fifty poor persons, amongst other things, a cask of red-herrings. Whether Sunday trading was permitted in those days I cannot say; but it is recorded that Thomas Alleyn, a shoemaker, and Thomas Hamond, a merchant, were each fined 2s. for having in November, 1541, "bargained and sold a last of white herrings in Yarmouth church in time of divine service." From time to time acts of parliament were passed enabling fishermen to "sell upon the land openly to whomsoever it pleased them," and declaring it to be "unlawful to make any restraint upon, or to take any toll in respect of, the sale of fish." And that such acts of parliament were needed is proved by the fact that, in 1584 the authorities of Great Yarmouth made an ordinance, or by-law, by which every ship coming to the port with salt—a very necessary fishing adjunct—or coals was compelled to

give one-twentieth part of her cargo to the town. So important, indeed, had the herring fishery become that it was customary, during the Free Fair, to send out armed vessels to protect the fishermen. At first these vessels, which were called "waffters," were provided by the town of Great Yarmouth; but subsequently, ships of war were sent by the government not only for this purpose, but also to convoy the merchantmen which, during the latter part of the sixteenth century, were annually despatched to ports in the Mediterranean with herrings. The importance of the herring fishery may also be inferred from the facts, that during its prosecution fishermen were exempted from being pressed into the service of the state, and that, during the holding of the Free Fair, special licenses were granted to the alehouses which were situated along the coast.

In the year 1580 more than 2,000 lasts, we are told, were carried into the haven of Great Yarmouth in one tide; but this, I think, must be an error. During the last twenty years there have been occasionally very heavy deliveries of herrings at Great Yarmouth, but there has rarely been a delivery of even 1,000 lasts in one day; and the deliveries for one day invariably mean the deliveries for two or three tides, and sometimes for five or six tides. We are also told, that at this period the value of the herrings brought in during a season amounted to hundreds of thousands of pounds; but this can

hardly be reconciled with the further statement, that "during the fair eight and ten goodly herrings were sold for a penny." That such a statement is an exaggeration, if it mean the wholesale price, may be reasonably inferred from the fact that, although the time for catching herrings now is double what it was then, it must be a very prolific season indeed, and prices must range very high, for the herrings brought into Great Yarmouth during a season to realize wholesale the sum of £250,000. If, however, the statement refer to the aggregate retail prices, it may possibly be near the mark, because at the present day the general public pay for the fish they consume three and four times more than the fishermen themselves receive for it. Herrings, of course, fluctuated in value according as the seasons were good or bad. In 1497 a last of cured herrings was worth £4, or about £36 of our money. In 1563 green or fresh herrings were sold for £9 per last, while six years later red-herrings brought only £8 per last; at this period money was worth about seven times more than it is at the present day.

In 1597 Great Yarmouth possessed two hundred and twenty fishing-boats, which were manned by about a thousand fishermen; and, it is said, that there were frequently spread upon the Denes there at one time herring-nets more than one hundred miles long, and worth upwards of £5,000. These facts are so modest that they may be readily believed.

But, of all the nations whose shores are washed by the North Sea, not one extended its fishing operations so rapidly as the Dutch. Indeed, from the time that Benkel, or Beukelz, invented his method of curing herrings, the progress of the Hollandese was truly marvellous, until, at the close of the sixteenth century, they were the greatest fishers in the world. Amsterdam is figuratively said to have been built upon herring-bones. In the year 1600 we are told that the Dutch possessed five thousand herring-boats, and that one thousand six hundred of their "busses," or vessels of the largest size, were employed fishing in British waters. In 1603 it is said that their catch of herrings was valued at 4,759,000 guilders, or £396,583 of English money; an enormous sum when the difference in the value of money now, and what it was two hundred and seventy-seven years ago, is taken into account. It is recorded that some few years later, the Dutch herring fishery was of such magnitude, that it required the services of two hundred thousand persons. It is also said that the nations prosecuting the herring fishery, other than the English and Scotch fishermen, captured altogether in the North Sea every year herrings that were worth between five and six millions of pounds sterling. But these statements must be taken with a very large grain of salt indeed.

During the seventeenth century the herring fishery off the East Coast of England, and the Free Fair at

Great Yarmouth, rapidly declined. This latter fact was due in some degree to the great difficulty which the inhabitants of Great Yarmouth had to keep open their haven. So sorely, indeed, were they pressed in this matter, that in 1624 they petitioned King James I. to grant them "a part of the lead and other useful materials of that vast and altogether useless cathedral in Norwich," for the "building of a workhouse and repairing the piers at the haven's mouth." But the principal cause of this decline was the reversal of the free-trade policy which hitherto had been upheld and enforced. James I. brought with him from Scotland his narrow-minded protectionist opinions, and lost no time in indoctrinating his English subjects with them. These opinions, we may fairly assume, were readily adopted at Great Yarmouth, because, soon after we find the inhabitants of that burgh grumblingly asserting that the "Dutch have for many years passed brought over their busses and their fishing vessels, and have taken the herrings on this coast and brought the same into Yarmouth, and sold the same for ready money, which money might as well have been gotten by ourselves and kept at home."

In 1600 the exportation of herrings from Scotland before old Michaelmas was prohibited; and in 1602, just before the Scottish king mounted the throne of England, it was arranged by commissioners representing England and Scotland, "that the fishing within fourteen miles of the shores of Scotland" should be

reserved to the Scotch. In 1603 Great Yarmouth undertook to supply the King's household annually with sixty barrels of white herrings at the price of 13s. 4d. per barrel, and ten casks of full red-herrings of one night's catch at the price of 6s. 8d. per cask.

In 1610 the first great blow at the prosperity of the Yarmouth herring fair was struck; parliament decreeing that foreigners should be prohibited from fishing off the coasts of England, unless they paid heavy duties for the privilege. The Dutch, who claimed immunity on the ground that they had been instrumental in the establishment of the Free Fair, remonstrated, and the privileges which they had enjoyed from time immemorial were restored to them for a time.

In 1611 herrings were so scarce at Great Yarmouth, that the "Windsor last," as it was called, cost no less than £15 5s., or between £70 and £80 of our money. In 1613 the Company of Fishmongers in London gave £12 per last for five hundred lasts of full red-herrings. In 1614 a barrel of red-herrings was worth 20s.

At this period the Dutch busses were considered to be the best vessels for fishing purposes; and, according to an old pamphlet which was published in London in 1615, a buss of seventy tons, to carry thirty-five lasts of herrings, was of the following dimensions:—Length of keel, fifty feet; breadth of main-beam, seventeen feet; depth from the lower edge of her deck-ledges to her ceilings, thirteen feet;

the rake of the stern forward was sixteen feet, and that of the stern-post aft was seven feet. The cost of building such a buss, and fitting it out for fishing purposes, irrespective of provisions, was as follows:—The hull of the vessel complete, £260; spars and sails, £44 10s.; four cables and four anchors, £99; sundry stores, £10 11s.; weapons and ammunition, £7 6s. 6d.; fifty nets, each thirty yards long and fourteen yards deep, fitted and tanned ready for sea, £171 17s. 6d.; corks, "pynbols" or buyes, now called bowls, £20 1s. 3d.; 750 fathoms of "war-ropes"—most probably an abbreviation of "wearing-away-ropes"—now called warp-ropes, £45 8s. 4d.; tools and implements for drying and packing herrings, £4 7s.; 1,200 casks or barrels, £75; thirty weys of salt, £60; total, £798 1s. 7d., a sum of money more than equivalent to £3,500 at the present day.

In 1616 the exportation of herrings in foreign bottoms was prohibited, and in consequence fifty sail of fishing-boats left Great Yarmouth. The impolicy of this prohibition was so apparent that the freemen of Great Yarmouth petitioned against it, and in 1624 a licence was granted to them to export one thousand lasts in foreign bottoms.

In 1619 Scotland claimed a heavy duty upon all herrings caught off its coasts by strangers; and in the same year English fishermen were prohibited from fishing off the coast of Finland.

In 1625, the reign of Charles I. was inaugurated

by an order in council which prohibited the Dutch from fishing off our coasts without first obtaining a royal licence. This order was enforced by the capture of several Dutch busses, in consequence of which Holland sent a squadron to protect her fishermen. The Dutch fleet fishing in the so-called British waters consisted then of one thousand five hundred busses, each of the burthen of about eighty tons, and it was protected by twenty men-of-war, each of which carried some twenty guns. These high-handed proceedings were, no doubt, amongst the principal causes which ultimately led to the war between England and Holland. It is said that the Dutch paid heavy royalties for fishing in British waters, but this statement needs verification.

The policy of the crown at this time appears to have proceeded from a desire to benefit our own fishermen by protecting them from foreign competition, because, whilst restrictive measures were passed against foreigners, special advantages and privileges were granted to our own fishers. This policy was warmly approved by Secretary Coke, who in 1632 published a treatise in support of it. He advocated the formation of a British Fishing Association; and proposed that the Dutch and French should be prohibited from even victualling their fishing-boats here in England. He enforced this view in the following language:—"The use they make of our countrie, to our great disadvantage in this matter of fishing, is

their coming on shore on the coasts of Norfolk and Suffolk, especially at Yarmouth (as was said) to drie their nets. This may seeme to be humanitie, and agreable to our good neighborhood and alliance, and not to be gainsaid. But the mischiefs thereof are great. First, without this help, they must of force quit the fishing to us again, when they can not make a voyage without meanes to drie their nets. Secondly, by this occasion they do not only carrie away our victuals to serve their fishings, but store of corn, beens and butter to feed their countrie and their armies. Thirdly, greater multitudes set foote on land than with safetie can be admitted. In all which respects, when our busses are readie and our fishing set on foote, occasion may be taken to disapoint them of this help, without which their chief fishing upon our coast can not subsist; and at least they may be taught to pay His Majesty his ancient rights, and to acknowledge his just soverainty in these seas as they were wont." In 1635 a patent was granted to one Thomas Davies, of Great Yarmouth for twenty-one years, on payment of the sum of £4 per annum, to "gauge and seal all red-herrings according to quality at a fee of 2s. 3d. per last;" but it was soon canceled, as it was found to be injurious rather than otherwise to the fishermen. This is the first indication of the "brand" system, which, since 1808, has been carried on in Scotland, and in Scotland alone. In the same year there was

granted to certain salt-makers a patent, which prohibited all other persons from erecting salt-works on any part of the coast from Berwick to Southampton; but, as it was found to be injurious to the fishing trade, restrictions were placed upon the monopolists, and soon afterwards the patent was canceled. From time to time licences were granted for the free importation of foreign salt, and tackle used on board fishing-boats; and, henceforth, salt used for the curing of herrings was exempted from duty. Companies for the prosecution of the herring fishery were also formed, and special privileges were granted to them. But, nevertheless, the fishery languished, and the fair at Great Yarmouth, being no longer a Free Fair, rapidly dwindled away, and became a shadow of its former self.

During the troublous times immediately preceding and during the Commonwealth, but little attention was paid to the herring fishery. The reign of Charles II., however, was commenced in 1661 by the passing of an act which prohibited the sale of herrings by the Dutch and French in England—a proceeding which still further embittered the relations between this country and France and Holland. At this time a barrel of choice red-herrings was valued at 20s., as we find that in 1662 the inhabitants of Lowestoft paid that sum for a barrel which they presented to Lord Holles.

In 1667 a rupture took place between Scotland and France, and the French captured six of the

largest of the Scottish herring-boats. At this period the herring fishery was prosecuted vigorously and successfully by the Scottish people, they sending to sea some eight hundred boats, which were manned by more than five thousand men. Considerable quantities of herrings were exported by them to the Continent, and to Ireland; and it is said that they supplied the latter country annually with herrings to the value of £60,000.

In 1671 Charles II., accompanied by the Duke of York, and by several of the nobility, visited Great Yarmouth, where—notwithstanding that the town had espoused the cause of the Commonwealth, and that there the death-warrant of his father had been determined upon, if even it were not actually signed—he was entertained right royally, and presented with four golden herrings and a chain of the value of £250. Subsequently, this merry monarch granted to Great Yarmouth, for the encouragement of its fishermen, the sum of £160 per annum, payable, however, not from his royal purse, but out of the excise duties on beer. In 1677 a royal council was appointed to draw up rules for the regulation of the sea fisheries. The King also ordered collections to be made in the churches for the encouragement of fishermen; granted a lottery for three years, and exemptions for seven years from customs upon export fish; and compelled all victuallers and coffee-house keepers to take a certain number of barrels of herrings

yearly, at 30s. per barrel, a price which was about double the market value, and which, considering the value of money at the period, was enormous.

I have shown that, from the earliest times until the reign of James I., the policy of England was to attract fishermen from all parts to the Eastern Coast, and to protect them from imposition in their dealings there; and that, from the latter period, its policy was to throw the *ægis* of protection over our own fishermen, and, by severe enactments, to render the trading of foreign fishermen here almost impossible. One would have thought that the policy of the former period, which brought peace and plenty and honour to the town of Great Yarmouth, would have received the strong and consistent support of its authorities; and that, when the new policy was inaugurated, they would have treated their own countrymen with affectionate consideration. The corporations of the olden time were, however, a bad lot; and the corporation of Great Yarmouth was no exception to them. Acts of parliament and orders of council were frequently passed in order to restrain or to prevent them from committing their selfish, grasping, predetermined, illegal acts; but, whenever opportunity offered, they evaded the law, and acted in such a manner as to give rise to the well-known saying, that "a corporation has neither a body to be kicked nor a soul to be damned."

From the earliest times Great Yarmouth had

claimed and received annually from the fishing-boats resorting thither, or belonging thereto, one dole or share of the earnings of each boat, which dole, for conscience's sake I suppose, the town divided equally with the church. In 1607 this dole amounted to £270. It also claimed jurisdiction to the south, as far as Kirkley roads, and many were the quarrels, and long and tedious and expensive the law-suits, between it and Lowestoft in consequence of the encroaching and grasping nature of its demands. These quarrels were not effectually settled until 1661, when a boundary post showing the extent of the jurisdiction of Great Yarmouth was with great formality placed exactly seven miles south of the crane which was fixed upon the quay at Great Yarmouth. From the earliest times, too, Great Yarmouth had derived a revenue upon the sale of herrings, which was called "heyning money," and which, in the early part of the seventeenth century, produced £348 per annum. What this "heyning money" really was, or how it was levied, it is difficult to say, except that it was the difference in the price arbitrarily fixed upon the herrings in some unintelligible manner, and the price which they realized when sold in the market, extreme care being taken to fix the price *below* the actual market value. But, no sooner had the crown inaugurated the policy of protection, than the Great Yarmouth corporation out-Heroded Herod. Ordinances were

made that all herrings brought in in one day, no matter what their quality might be, should be sold at what was called "tide price;" that the corporation should take half the quantity that might be brought in; and that the herrings from fishing-boats not belonging to the town should be sold only to freemen of the borough—a class of persons who were of, if even they did not personally belong to, the corporation. "Tide price" was the price fixed by an interested buyer without competition upon the first lot of herrings brought in, and was to rule the price of all herrings for the day. Some idea of the consciences of the men who so fixed the price, and who were called—facetiously, I suppose—"hosts," may be formed from the fact that in the revolutionary year, 1688, when there were only fifteen merchants at Great Yarmouth, the "heyning money" amounted to no less than £2,000, a sum larger by £700 than the amount which the corporation now annually derives from the dues taken at the fish-wharf. This fact speaks for itself; and I hardly need the testimony of a petition on the subject, which was presented to parliament by the fishermen and fish-merchants of Lowestoft, and which states as follows:—"The first freeman that comes on board must be his 'host,' and will set the price of the fishers' herrings without their knowledge or consent, which is commonly from 20s. to 50s. per last cheaper than they give to their townsmen."

This protection policy of the government, and this conservative policy of the corporation, well nigh ruined the herring fair. The protection policy of the government prevented foreign fishers from selling their herrings at Great Yarmouth, but did not, because it could not, prevent foreign boats from fishing within sight of these shores; whilst the conservative policy of the corporation drove the West-country and North-country boats to other ports, and reduced the number of the herring-boats belonging to Great Yarmouth to little more than fifty. Tyranny, however, like a large dose of arsenic, invariably provides its own antidote. All history teaches us that, when the strain upon suffering humanity has become too great to bear, there has always come to the front

> "Some village-Hampden, that with dauntless breast
> The little tyrant of his fields withstood."

It was so in this case. The local patriot, or "cantankerous fellow" as the corporation called him, appeared in the person of one John Andrews, who was a worthy alderman of the borough, and a plucky fellow too; because it is one thing to fight against a corporation with your own money, and quite another thing to fight as a corporation against an individual with the sinews of war which are provided out of the public purse. As a matter of fact, many a man has had to submit quietly to gross

wrong and injustice simply because his persecutors have been men who could indulge their spite at the public expense. Well, John Andrews defied the corporation, and, of course, the corporation went to law with him. It was advised to do so by its town clerk, who was prepared to pledge his professional reputation that he was right in law, and, of course, that was all the corporation cared about; with the morality of the question it considered it had nothing whatever to do. Accordingly, in 1709, a bill was filed in the Court of Exchequer by the corporation against the "cantankerous fellow;" but, in reply thereto, the local patriot contended that the "ordinances or bye-laws of the corporation were illegal." To the surprise of the corporation and the town clerk, and to no one else, the court held that the ordinances were illegal; and from that moment the corporation revenue, which hitherto had been derived from the "heyning money," ceased. Of course, the corporation was terribly annoyed and crest-fallen at the result, and, to show its dignity, it deposed John Andrews from his aldermanship, and, to punish him, refused to grant him permission to make steps into his new house on the south quay, considering that, until he had refunded all the charges he had put the town to, he ought to go into it "by a movable ladder." We are not told how this matter ended, but I have no doubt that John Andrews made

his steps, and left the corporation and the town clerk to help themselves.

I have referred to the fact that the corporation of Great Yarmouth divided equally between itself and the church one dole or share of the earnings of every boat which made use of that port. But, for centuries the church claimed and received for itself alone, all along the coast, a half-dole, which, from the sacred uses to which it was supposed to be put, was called "Christ's half-dole." The origin of this half-dole may be traced to those dark ages in which men were more superstitious than pious; and when serf and lord were equally ignorant, and equally at the mercy of the priest. The half-dole was, no doubt, in the first instance a free-will offering, given in the hope of thereby securing a good voyage, much in the same spirit as heathen make presents to their idols in order to propitiate them. The making of this free-will offering soon became a custom—a custom which in time came to be considered as a right; and this right was tenaciously claimed and rigorously enforced by Catholic priest and Protestant clergyman until the middle of the present century. And well it might be from a worldly point of view, because it formed no inconsiderable item in the value of a living. From time to time efforts were made to shake off this incubus; and, as late as 1845, the Rev. F. Cunningham, vicar of Lowestoft, summoned before the Rev. E. M. Love and Edward Leathes, Esq., two of the

magistrates for Suffolk, a fisherman named John Roberts "for having refused or neglected to pay tithes for his fish." The case was argued for the defendant by Mr. J. H. Tillett, of Norwich, who contended that the "tithe did not arise," as was stated in the information, "in the parish of Lowestoft, *but* in the sea," and that, therefore, as it was neither legal nor just, it could not be enforced. The magistrates, however, found for the complainant, and made an order for 10s. 3d. tithe and 10s. costs. Whether this order was obeyed or not I cannot say, but since then, as far as I have been able to learn, this custom has been more honoured in the breach than in the observance. I have been told that the custom was enforced at Great Yarmouth until a fisherman, happening to have a tenth child born to him, took it to the vicarage-house in the vain hope that the vicar would adopt it. Whilst this custom was enforced special religious services were held, during the herring season, for the spiritual welfare and earthly prosperity of the fishermen; and, from an old manuscript, I learn that the proper psalms and lessons in use at such services were as follows:—Psalms—the whole of the lxvth; verses 19 to 41 of the lxxviiith; from verse 24 to the end of the civth; verses 23 to 32 of the cviith. Lessons—Genesis i., 20 to 24; 2 Kings vii., 1, 2, and 20; Habakkuk iii., 17 and 18; Matthew viii., 23 to 27; Luke v., 4 to 10; John vi., 26 and 27. Before the Reformation it was

usual for the priest "to give a blessing to the fishing yearly." The priest still holds sway over the fisherman in Catholic countries. Before a boat is first launched in France, it is visited by a priest, and plentifully besprinkled with holy water; and the ceremony of "blessing the sea," which takes place annually at Boulogne before the commencement of the herring voyage is a sight worth seeing. It may be interesting here to state that the half-dole which was claimed by the town of Great Yarmouth ceased to be collected in 1824.

The eighteenth century was a most remarkable period, not only in the general history of nations, but in the history of the herring fishery. The importance to a maritime nation like Great Britain of an industry which was in reality a nursery for its navy came to be fully recognized on all hands, and in consequence, the most strenuous efforts were made to stimulate and encourage it. Various and strong inducements were held out to prosecute it; and as a result, greater numbers of fishing-boats were fitted out all round the shores of the United Kingdom, fresh fishing-grounds were discovered, and "voyages," as they were called, other than those which hitherto had been made, were entered into and prosecuted with success. And similar efforts, with similar results, were made by our continental neighbours.

In 1702 war broke out between France and Holland. At that time the Dutch herring fleet was guarded by

only four ships of war. These the French attacked in Broussa Sound, and having sunk the admiral's ship, destroyed no less than four hundred of the Dutch busses of the largest size. This was the first great blow to the supremacy of the Dutch in fishing operations. During the century she gradually retrograded as a fishing nation, until in 1784 she sent only two hundred and seventy busses to the deep-sea herring fishery.

In 1707 immense schools of herrings appeared off the Scottish coasts; and we are told, that on one occasion—being probably frightened by whales, cods, dog-fishes, and other enemies—such an enormous quantity rushed ashore at Cromarty that the beach was covered with them to a considerable depth, that salt and casks to cure and preserve them failed the inhabitants, and that the residue was carted away for manure.

The decision of the Court of Exchequer in 1709 in the cause "The Corporation of Great Yarmouth *versus* John Andrews," saved the herring fishery at that port from utter extinction, because it protected our own countrymen from the frauds which hitherto had been practised upon them; and, on the government repealing the prohibitive restrictions on foreign fishing-boats, the annual herring fair at Great Yarmouth began to put on a semblance of its former importance. In the interregnum, however, other markets for the sale of herrings had been opened

and established, and the fair never recovered its former prestige. Amongst foreigners it was supported solely by the Dutch fishermen, and henceforth it was known as the "Dutch Fair." It lingered until the present century, when it gradually dwindled away.

Notwithstanding, however, that foreign fishermen refrained from attending the herring fair at Great Yarmouth, they prosecuted the herring fishery off these shores in the most calculating and deliberate manner. Their vessels being much larger than the luggers belonging to this country, and being manned in proportion, they appropriated to themselves the best of the fishing-grounds, and in order to secure it to themselves, they were in the habit, it is said, when not fishing, of anchoring there. We are told that in 1751 no less than four hundred Dutch busses, and one hundred and twenty French vessels, prosecuted the fishery in sight of this coast; and that in September in the following year, above three hundred French vessels, manned with more than nine thousand men, took up their stations at the back of Yarmouth sands. During last century France distanced all her rivals in fishing operations, operations which benefited the whole of the civilized world, but which were repressed, though not rendered entirely useless, by the terrible and guilty war which was subsequently waged so blindly and so malignantly between her and this country.

The dwindling away of the herring fair was a most

unfortunate circumstance for the merchants of Great Yarmouth and Lowestoft, who were largely dependent upon other than their own boats for the herrings which they needed to cure for exportation, as well as for home consumption. For centuries they had been celebrated for their cure of red herrings; and the importance of their trade may be estimated from the fact that, in 1755, according to an old manuscript, they cured between them some 70,000 barrels, Great Yarmouth curing about double the quantity that Lowestoft cured. Of these barrels 13,000 were sent to Leghorn, 7,500 to Naples, 5,700 to Venice, 5,500 to Genoa, 4,500 to Ancona, 900 to Cadiz, 700 to Trieste, 700 to Civita Vecchia, 500 to Bordeaux, and 13,000 to Holland; the balance of 18,000 barrels was reserved for home consumption. In this year the merchants of Great Yarmouth possessed seventy-nine boats, and those of Lowestoft thirty-five; and in order to obtain the supplies which they needed, they were compelled to hire the North-country cobles and the West-country boats which, during the middle and latter part of last century, again resorted to the fair at Great Yarmouth in considerable numbers. In the year last named the number was as high as one hundred and fifteen. The plan of hire was for the merchants to pay down a certain sum for the hire of the boat called "steerage money," and to agree to purchase at a fixed price all the herrings which might be caught by such hired boats during the season.

Both the "steerage money" and the price per last varied from year to year, the "steerage money" from £63 to £26, and the price per last from £8 to £4 10s. This plan is still pursued in Scotland and Norway; in the former country the sum which is paid at the commencement of the voyage is called "bounty money."

From 1755 until England commenced hostilities against France, because she chose to recognize the United States as an independent nation, and subsequently against Holland for the same reason, the number of boats which were fitted out from Great Yarmouth and Lowestoft varied considerably from year to year, but never exceeded seventy-nine at the former, and forty-eight at the latter place. During the same period the North-country cobles which visited Great Yarmouth gradually diminished in number, though they were invariably in excess of the boats which belonged to that place; while the visits of the West-country boats became like the visits of angels, few and far between. The term "West-country boats" is a misnomer and very misleading. The boats belonged to the south coast, and not, as might be fairly supposed, to the west coast of England. The appellation arose in this way. Originally the Cinque Ports, which were all situated on the south coast, were divided into "east ports" and "west ports," and boats hailing from them were, in consequence, called East-country boats and West-country boats.

Nearly all, if not all, the herring-boats from the south coast which prosecuted the Great Yarmouth herring fishery belonged to Hastings or its vicinity, and as Hastings was one of the western Cinque Ports, the boats from thence were called "West-country boats;" and to this day all fishing-boats belonging to the south coast, when fishing off the East Coast of England, are called "West-country boats."

The Great Yarmouth and Lowestoft merchants were now subjected to severe competition in their particular trade of curing red-herrings, as "smoke-houses" were established about this time in Scotland and in the Isle of Man, and "green" herrings were made into "reds" and "blacks" at those places as well as at Great Yarmouth and Lowestoft. The adjective "green" is the trade synonym for "fresh," and "red-herrings" and "black-herrings" are trade terms for particular descriptions of cured herrings. Some idea of the energy with which the canny Scots entered into this trade may be judged from the fact, that in 1777 two companies, one at Dunbar and the other at Eyemouth, had each of them "smoke-houses" large enough to cure at one time nearly one hundred lasts of herrings. This competition, however, lasted but a short time, as it was found that the quality of the herrings which were caught off Scotland and the Isle of Man were very inferior for smoking purposes to those caught off the coasts of Norfolk and Suffolk. And to this circumstance,

I think, may be attributed the fact, that herrings caught elsewhere than off the coasts of Norfolk and Suffolk, if not intended for immediate consumption, are almost invariably cured with brine, or "pickle" as it is called, and not with dry salt and the smoke from burning oak billet.

At the breaking out of the war with France, it was proposed by the French that all unarmed vessels should be exempted from hostilities, but the proposition does not seem to have been agreed to, or if agreed to, it was not acted upon, as insurance premiums rose to fifty per cent., although the ordinary rate of insurance of a herring vessel for the season was £3 3s. per cent.

During the latter half of the last century the government of the day granted special bounties to the fishermen and boat-owners both of England and Scotland. From 1751 to 1782 it is calculated that £316,365 were paid in this manner in Scotland; what was paid in England is not known. From 1787 to 1794 the sum of £7441 was paid to the owners of Lowestoft boats. What amount was paid to boat-owners residing at Great Yarmouth, and elsewhere, I have not been able to discover; but, of course, it was proportionately larger or smaller than the sum named, according as the boats were in excess or not of the boats at Lowestoft. These bounties, it is said, were intended as a kind of set-off against the heavy custom and excise duties which were chargeable upon

the various new materials that were required for the building and fitting out of fishing vessels. These duties were calculated to amount to upwards of £150 per vessel, and treating the matter as a purely business transaction, it is said the government benefited greatly by it.

At this period the Swedish herring fishery was prosecuted with such success that, beyond the herrings which were required for home consumption and a large export trade, immense quantities were boiled down simply for their oil. In 1781 the Swedes exported more than 130,000 barrels, a quantity which exceeded the number exported by the Scotch.

The year 1793 was remarkable for a case which was tried at Thetford assizes before Mr. Baron Perryn, and which established the custom that fishermen were bound to make proper signals whilst fishing. The plaintiff was one John Sayers, a fish-merchant of Great Yarmouth, and the defendant was one Henry Barrett, a boat-owner of Lowestoft, and the action was brought to recover damages "for injury done to the plaintiff's nets by the defendant's improper management of his vessel in neglecting to hoist the usual signals at the time of shooting his nets." A verdict was given for the plaintiff, and the defendant was ordered to pay £5 as damages, and the costs of the suit. The chronicler whom I quote quaintly says: "This decision at once established the custom and necessity of a due

observance of signals by fishermen, and is consequently of great importance."

In 1794 great quantities of herrings were taken in the Forth; and a new feature in the trade was that fresh herrings packed in boxes with ice were sent to London by fast-sailing vessels. It may be interesting here to state that ice was first employed in this island for the preservation of fish in a fresh state in 1780. The gentleman who so used it was a Scotchman of the name of Dempster, and the fishes he preserved were salmon. Since that time the use of ice as a preservative of food has greatly increased; and, indeed, to this means may be attributed the marvellous development of the trawl and mackerel fisheries which has taken place in recent years. Of late, fish-merchants have been in the habit of packing fresh herrings in ice instead of with salt, and in consequence bloaters are now made in inland towns as well as at the sea-coast.

During the eighteenth century the prices of herrings fluctuated considerably, but with an upward tendency. In 1738 herrings were £7 10s. per last; in 1748 they were £12 per last; and from that time until the end of the century they varied generally from that sum to £15 per last. In 1789 they rose to £20 10s. per last, and in 1800 to the extraordinary price of £30 per last. The purchasing power of money has greatly lessened since the last century.

During the present century, and especially since

the conclusion of the Peninsular War, the fishing for herrings has been greatly developed, not only in the United Kingdom, but also among all the nations whose territories border upon the Northern Seas, and in the northern parts of America. The greatest development, however, has taken place since the inauguration of steam and the railway system of conveyance, by which means fresh or unsalted fish has become an article of daily food where before it was comparatively unknown.

No nation, however, has made such marvellous progress as the Scotch, who are now by far the greatest herring-fishers in the world. They possess the enormous number of 14,500 herring-boats, which are worked by some 50,000 men and boys, and the season of 1880 was the heaviest they have ever known. The catch on the East and West Coasts of Scotland amounted to 970,000 "crans," or 767,500,000 herrings, which, counting by the Great Yarmouth tale, would be 58,144 lasts. The estimated wholesale value of these herrings was, in round figures, £1,000,000.

The herring fishery along the Eastern Coast of England has progressed extensively, and Great Yarmouth and Lowestoft, as centres of it, are now more important than ever they were before. During the early part of the present century it is said that the average yearly delivery of herrings at Great Yarmouth was something like 3,500 lasts, and that

the average yearly delivery at Lowestoft was about half that quantity. In 1817, which was an exceptional year, the deliveries at Great Yarmouth amounted to between 7,000 and 8,000 lasts. In 1853 it is said that upwards of 10,000 lasts of herrings were cured at Great Yarmouth, and that the quantity of salt used during that season was more than 10,000 tons. Ten years later, when the project of building the fish-wharf at Great Yarmouth was first mooted, the yearly delivery there was estimated at 15,000 lasts. Since the opening of the fish-wharf we have been able to obtain information on this point with something like statistical accuracy. The fish-wharf was opened November 5th, 1867; but as that was in the middle of the herring season, I exclude that year from my calculations. During the thirteen years in which the fish-wharf has been in full operation there have been delivered there 197,462 lasts. There have, however, been delivered at the free quays large quantities of herrings of which no official notice has been taken, and we may, therefore, reasonably assume that during the last thirteen years the grand total of herrings delivered at Great Yarmouth has been at least 210,000 lasts, or the marvellous quantity of 2,772,000,000 of herrings. During the same period there have been delivered at Lowestoft 122,367 lasts, of which 13,455 lasts were delivered in the spring-time, and 1568 lasts during the summer-time. The mid-summer herring fishery of late years has not

been of much importance, although it is spoken of as far back as the time of Manship, or early in the seventeenth century. The spring herring fishery is of very recent origin, and is carried on by boats which invariably make Lowestoft their port of delivery. During the last thirteen years the largest deliveries of herrings were at Great Yarmouth in 1870, and at Lowestoft in 1871; the deliveries being respectively, Great Yarmouth, 19,420 lasts, and Lowestoft, 16,144 lasts. The smallest deliveries were at Yarmouth in 1878, and at Lowestoft in 1879, the respective deliveries being, Great Yarmouth, 10,154 lasts, and Lowestoft, 6,509 lasts. What the statistics are for other places along the coast, and for our foreign rivals, I have been unable to ascertain. In the report of the Fishery Commissioners for 1878 it is stated that 2,400,000,000 of herrings are caught annually in the North Sea by the British, French, Dutch, and Norwegian fishermen, a quantity which represents 181,818 lasts.

Of course the herring fishery is a huge lottery, as one boat may catch an enormous number of herrings, whilst another boat may capture comparatively few. It often happens that one boat catches more herrings than several other boats fishing immediately round her capture altogether. The consequence is that one boat may make a splendid voyage, whilst other boats, equally well found and manned, may raise barely enough money

to cover expenses. Formerly it was the custom to divide the autumnal voyage into two parts—the "North Sea fishing," and the "home voyage"—but this practice continues now only at Lowestoft. The most usual plan is to treat the whole of the autumnal voyage from August to December as one, and it is in that sense that I wish to call attention to some extraordinary voyages that have been made at different times, by different boats. In 1853 the boat "Perseverance," belonging to Mr. Thomas Lettis, of Great Yarmouth, caught 126 lasts. But this was surpassed in 1870 by the "Eclat," belonging to Mr. Barnard, of Caistor, which captured 137 lasts; and by Mr. George Balls in the "Warrior," belonging to Mr. S. K. Smith, of Great Yarmouth; and by Mr. Robert Graystone in the "Eagle," belonging to Mr. Charles Minns, of Bungay; the former of whom caught 138 lasts, and the latter 142 lasts. These three boats, therefore, captured between them in one season no less than 417 lasts, or 5,504,400 herrings. But the greatest voyage, comparatively speaking, that ever was prosecuted, was made in 1737 by a boat belonging to a Mr. Joshua Marshall of Lowestoft. It must be borne in mind that at that time boats only fished from the early part of September to the middle of November, that the boats were small in comparison with those of the present day, and that the killing power of the nets then used—considering their quality, size, and number—was not half what

it is now. Yet the boat to which I refer caught and landed no less than seventy-two lasts, or 950,400 herrings.

At various times extraordinary single catches of herrings have been made. In 1857 John Lake, when fishing in the "Racehorse," belonging to Mr. I. Shuckford, of Great Yarmouth, with only ninety-one nets, caught so many herrings that it was impossible for the boat to carry them; he stowed away and brought in twenty-one lasts, and he believed that he threw overboard some nine or ten lasts more. In the month of October, 1865, Alfred Kettle, master of the "Commission," also belonging to Mr. Shuckford, netted and secured twenty-six lasts of herrings. In 1880 a French fisherman made a haul of thirty-five lasts; and I am assured that, some few years ago, another Frenchman caught at one time the extraordinary number of 700,000 herrings, which would be equivalent to fifty-three English lasts. In the early part of August, 1881, the nets of the "Gabrielle" of Boulogne struck a "school" so heavily, that after taking on board thirty-five lasts, and giving ten lasts to two Penzance fishermen whose boats were near her at the time, her crew were occupied for more than eight hours in scudding overboard the remainder of the herrings that were in her nets. There have been occasions when the herrings have been struck in such immense quantities, that the weight of

them in the nets has been so great that the warp-rope has been broken, and both herrings and gear—the latter alone amounting in value to between £300 and £400—have been irredeemably lost. During the night of the 21st October, 1865, Mr. Robert George of Great Yarmouth, when fishing in the "Bluejacket," had his nets struck so heavily by a "school" of herrings that the rope broke, and the nets went to the ground and were lost. Some four or five of the nets were recovered, and in each of these was something like half a last of herrings. Mr. George was fishing at the time with one hundred and twenty nets, so that it may be fairly inferred that between fifty and sixty lasts of herrings were captured in his nets at that time.

During the first half of this century prices ranged generally from £12 to £14 per last; but from the time of the development of the railway system prices have fluctuated very considerably, and have depended much more than they formerly did upon freshness and quality. Fresh herrings and "bloater stuff" occasionally bring wholesale prices of from £40 to £56 per last, but as a rule they are generally bought and sold for about half that price. A last at Great Yarmouth is 13,200 herrings; why it should be so it is difficult to say, but perhaps the following is the reason. The word *last* is of Saxon origin, and means a quantity of any kind of goods of the weight of two tons. During the dark

ages, bricks, wool, and other commodities, as well as herrings, were sold by the last; and all through the last century wheat was sold at Great Yarmouth by the last. It is somewhat remarkable that a last of ordinary-sized full herrings weigh about two tons, whilst a last of small shotten herrings weigh from about a ton to a ton and a quarter. From these facts it may be reasonably inferred that little or no difference in the size and weight of herrings has taken place during, at least, the last six hundred years.

A real "Yarmouth bloater" is a full herring slightly salted and smoked; it should be eaten within two or three days, as it will not "keep" long, and soon loses its flavour. The precise period at which "Yarmouth bloaters" were first manufactured is not known, but it is believed to have been in or about the year 1835. It is said that the discoverer was a Yarmouth herring-curer of the name of Bishop, and that his discovery was due partly to accident, and partly to a happy thought. One night, after his fish-house hands had left the office, Bishop found that, by some mischance, a small quantity of a prime parcel of fresh herrings which he had bought had been overlooked. To prevent the herrings from being spoiled he sprinkled them with salt, spitted them, and hung them up in a "smoke-house" in which oak-billet was then being burned; and the next morning he was both astonished and delighted at their appearance, and with their aroma and flavour. Thenceforth he made the cure

of bloaters a special pursuit, and as other curers speedily followed his example, in a very short time the "Yarmouth bloater" became known far and wide.

The idea of making the "Newcastle kipper" was conceived and practically worked out in 1843 by the late Mr. John Woodger, of Newcastle, and subsequently of Newcastle and Great Yarmouth. His place of operation was a primitive one, being a large chimney, the like of which can be seen only in old-fashioned country houses, the chimneys of which are so large that one can literally sit within them, and, from that point of vantage, watch the stars as well as the glowing embers at one's feet. His experiments were successful in the highest degree; and the next year he commenced business on a somewhat large scale. In 1846 he sent his first consignment of "kippers" to London, and since then the "Newcastle kipper" has become almost as famous as the Yarmouth bloater.

This part of my subject would not be complete were I to omit all reference to the nets with which herrings are caught. The mesh of the herring-net is square, or as near so as possible, in order that when the net hangs in the water, the mesh may be kept widely open. When it was invented is unknown, but it has been used from time immemorial. The nets used in the olden time for catching herrings were much shorter, and fewer in number to form what is

termed a "fleet," than those which are now employed. Fifty years ago, along the East Coast of England, nets when fitted up for use were only some twelve or thirteen yards long, whereas they are now twenty yards long. Then, a fleet of herring-nets—that is, the number of nets which are shot into the sea at one time—varied from sixty-one to ninety-one nets. Now a fleet consists of from one hundred and one to one hundred and eighty-one nets. English fishermen invariably fish with an odd net, though why they do so I am not able to say. The length of the fleet of nets used by our own countrymen varies from about a mile and a quarter to upwards of two miles. Nets used by Scotch fishermen are forty yards long, and a Scotch fleet consists of forty-eight nets. The French, whose boats are larger than the English craft, frequently shoot at one time as many as two hundred and eighty nets, which in length would be about three miles. The same sort of net is, of course, used by every nation that prosecutes the herring fishery. Up to a very recent period herring-nets were made by hand, and of hemp; now they are made by machinery, and principally of cotton, which is found to be far more destructive in its catching power than hemp.

The inventor of the herring-net loom was a working-man named James Paterson, who was born at Musselburgh in Scotland towards the close of the last century. He was brought up to the trade of

a cooper, but subsequently he enlisted in the army, served in Egypt and the Peninsula, and was one of the heroes of Waterloo. From his early boyhood he conceived the idea of inventing a machine to make herring-nets, and throughout his military career the idea never forsook him. After the battle of Waterloo he quitted the army and took up his residence at Queensferry, but subsequently he removed to Musselburgh, his native place. There he devoted himself to the invention of his net-loom, and, after years of work and many disheartening failures, at length succeeded in accomplishing the object of his life. His greatest difficulty was the formation of a knot that would not slip. He did not succeed in making a knot like that which is put on by hand, but he made one firm enough, and which answered the purpose. Subsequently a working plasterer named Walter Ritchie, of Leith, discovered a plan of forming a knot like the hand-knot with the machine, and this improvement has been universally adopted. Paterson patented his invention, and in 1820 set up a factory for making herring-nets, in Bridge Street, Musselburgh; but it took many years to overcome the prejudice and ill-will which the unthinking mob have at all times displayed towards new inventions and uncanny ways; and, as soon as his invention became a thorough success, an envious individual endeavoured to rob him of the fruits of his skill and labour. In 1849

Paterson's factory passed into the hands of Messrs. J. and W. Stuart, of Musselburgh, who are now the largest manufacturers of herring-nets in the world. Messrs. Hounsell, of Bridport, are also makers of large quantities of herring-nets; and Mr. Craigg, of Lowestoft, has a factory which is well worthy a visit. Since the advent of railways an immense impetus has been given to fishing operations, and herring-nets are now made by thousands where formerly they were made by tens. During the autumnal herring season there are frequently from 8,000 to 10,000 miles of nets in the North Sea at one time; and I am sure I am well within the mark when I say, that the herring-nets belonging to the fishermen of Scotland and England alone would, if placed end to end, considerably more than encircle the entire globe.

CHAPTER IV.

Our Sea Fisheries in the Future.

Importance of the subject—Erroneous deductions—The sea exhaustible—Trawling—Newly-invented trawling apparatus—Destruction of fry—"Close times"—Small-meshed nets—Square meshes for trawl-nets—Proper size of drift-net meshes—Legislative interference—True principle of legislation—Individual enterprise should be trammeled as little as possible—Legislative enactments should be based on actual experience—"Orders in council"—Fishing-boat lights—Legislation for the fishing industry should be distinct and separate from that for the mercantile marine—The Shipping Act of 1880—What is just for a government is just for an individual—Merchant vessels should carry distinguishing marks—Concurrent jurisdiction in salvage cases—Signing of "share" contracts—"Half-yearly returns" a delusion—Compulsory pilotage—Fees of receivers of wreck—Admiralty droits—Manorial rights to fore-shores—The shell-fish industries—Mussel-farm at Aiguillon—The law relating to trawlers and drift-boats—Great increase of trawlers—Supply of trawl-fish—The sea mapped into districts—International convention—"Coopering"—The Scotch Fishery Board—A central authority to supervise the fisheries of the United Kingdom—Just a few words about the fishermen.

The supply of food for the ever-increasing multitude, is a question which is becoming more than ever important; and the future of our sea fisheries is, therefore, of the deepest national concern. By some persons it is believed that the sea is inexhaustible, and

the wildest opinions regarding the supply of fish for food have, in consequence, been expressed and promulgated; opinions which have been based upon isolated and exceptional facts, without reference to, and apparently in utter defiance of, the surrounding circumstances. The Fishery Commissioners in their report which was issued in 1866, state that "five trawlers belonging to the same owner, in one single night's fishing, brought in seventeen tons weight of fish, an amount of wholesome food equal in weight to that of fifty cattle or three hundred sheep;" and from this fact they argue that, as "once in the year an acre of good land, carefully tilled, produces a ton of corn, or two or three hundredweight of meat or cheese, the same area at the bottom of the sea on the best fishing-grounds, yields a greater weight of food to the persevering fisherman every week in the year." But such a deduction is incorrect, because such a catch of trawl-fish as is here referred to is most exceptional. I have already shown that herrings weighing more than fifty tons have been taken at a single haul; but every practical fisherman knows that at certain periods of the year, hundreds of square miles of the North Sea alone might be fished both with trawl and drift nets without the fishermen obtaining the scantiest reward for their labours. A certain learned professor, in a lecture upon the herring which he recently delivered, gave it as his opinion that "the best thing for the government to do was to

let people pursue their fishing when they like, where they like, as they like, and how they like;" but if that be correct, how is it that trawl-fish, especially soles and plaice, have, comparatively speaking, become so scarce? that the mackerel fishery off the Eastern Coast of England has been all but annihilated? and that whilst, during the last twenty years, the killing power of drifters in the same district has been increased at least six-fold, the quantity of herrings captured has increased but slightly, if even it has increased at all? The stern fact is, that the sea *is* exhaustible; and believing, as I do, that the great fish-farm round the British Isles should be worked with judgment as well as with skill, I invite attention to those matters, the due observance of which in the future will, in my opinion, conduce to the benefit both of fishermen and the community at large. In considering this most important subject, however, it will be impossible to treat of drift-fishing apart from trawl-fishing; and therefore, in order that I may not be misunderstood, I will give a short description of the latter industry.

Trawling, as it is now understood and practised, is, comparatively speaking, of modern date, and until the last half-century was, as compared with drift-fishing, of very secondary importance. The apparatus now in use consists of a huge beam of wood called the "trawl-beam, trawl-heads, trawl-net, ground-rope, bridles, trawl-rope, derrick, and hook," and

all the gear necessary for "streaming" and getting it safely inboard. Trawl-beams vary in length from twenty to fifty feet, according to the size and power of the vessels from which they are worked; and it is difficult to get the longer ones of the required length and stoutness. It is usual to make a long beam by "scarfing" together two pieces of wood by means of iron bands, which are put on very hot, and consequently contract and tighten as they cool. The trawl-beam is supported at each end by an iron hoop called a "trawl-head," which is generally about three feet high, and the height of the head is accordingly the height from the ground at which the beam is carried. These trawl-heads are flat and straight at the bottom, so as to keep the trawl-beam in a horizontal position. This beam and these heads are fixed firmly together by means of wedges, the driving in of which at sea is a dangerous operation. To this beam and these heads the trawl-net is securely fastened, and the three parts become one apparatus, and cannot be readily separated one from another. Some trawl-nets are provided with what are designated "pockets," and some with what is called a "flapper." "Pockets" are formed on each side of and within the net below the ground-rope, by fastening part of the side of the net to a similar portion of the bottom part of the net, thus forming a *cul de sac*, the entrance to which is well within the net; these "pockets" interfere greatly with the

symmetrical flow of the net. The "flapper" is a piece of net which is fastened to the upper part of the inside of the net, and is allowed to fall down to the bottom part of the net, and the notion is that it does not stop the ingress of fish, but that it does stop their egress. The upper part of the net which is attached to the trawl-beam is longer than the lower part which is permitted to drag along the ground. To keep this lower part to the ground, as well as to prevent mishaps as far as possible, it is fixed to what is called the "ground-rope." This ground-rope is sufficiently long to form a half-circle, or other desired curve, and is made of chain bound round with old netting or other material and rope, which is called "wolding." The apparatus thus formed is sunk to the bottom of the sea by a "trawl-rope," and two shorter ropes which are called "bridles." One end of these "bridles" is fixed to one of the trawl-heads, and one end of the other "bridle" to the other trawl-head, and the opposite ends of these "bridles" are brought together and firmly attached to one end of the "trawl-rope," the other end being securely fastened to the vessel. Sometimes a third bridle, called a "dandy-bridle," is used. This is fixed at one end of the beam, and is used to haul inboard that end of the beam when it is brought near to the surface of the water. By these "bridles" and "trawl-rope" the apparatus is sunk to the bottom of the sea, is dragged over or

through the ground by the vessel to which the trawl-rope is attached, and is hauled up bodily with the contents of the net. Two or three hours are often expended, and sometimes seven or eight hours, in what is called "getting the gear." When the trawl-beam has been got as near to the top of the water as possible it has to be "sided;" that is, it has to be got to and upon the vessel's rail. This operation is performed aft by means of a "derrick," "fall," "block," and "hook," and forward by means of a "fall," a "runner," a "fish-hook," and the necessary forehead tackle, and in bad weather is a most difficult and dangerous operation. When the beam has been "sided" the net is "swept," that is, a rope is passed round it and drawn tight just above the "cod-end," and it is then hauled on board. The "cod-end" is the lower part of the net; it opens at the bottom, through which the contents of the net are shot upon the deck. The "cod-end" is tied up with a rope, and a part of it, which is called the "cod-line," is left free, and by it the "cod-end" is assisted inboard. The trawl-rope and bridles are got on board by means of the capstan. The strain is immense, and if the parts of the vessel over which the ropes are dragged be not covered with metal they are soon worn into deep furrows. The ropes, of course, suffer in a corresponding degree.

For a long time it was believed that trawling operations must, of necessity, be greatly destructive

of fish-life; but this opinion has been modified since it has been proved that spawn floats and vivifies at or near the surface, as well as at the bottom, of the sea; and that, if such operations destroy the spawn of edible fishes, they at the same time destroy the eggs of the rapacious dog-fish, which undoubtedly fasten with their vine-like tendrils to the plants which grow at the bottom of the sea. Of late years dog-fishes have ceased to be the pest to herring fishermen that they formerly were; and if their non-appearance in large numbers now is to be attributed to trawling operations, then such operations have been and are a positive boon to drift-net fishermen. The vegetation in the sea is certainly as conducive to the well-being of fishes as trees and plants upon the land are to that of birds, and its unnecessary destruction should be prevented as far as possible. One of the objects of my newly-invented and patented trawling apparatus is to prevent, or to minimize to the utmost, this destruction. My apparatus goes upon wheels, which roll over the ground and simply press down the vegetation, instead of ploughing into the one and tearing up the other by the roots, as is done by the ordinary "trawl-heads." The object of the trawler should be to sweep the ground, and not to dredge it; and for this reason I fit up the ground-rope of my net with rollers, in order to facilitate its passage over the bottom of the sea.

The comparative scarcity at the present day of the more edible fishes is attributed, and I believe rightly attributed, to the immense and wasteful destruction of fry, and of small fishes, which is caused by the indiscriminate use of small-mesh nets. It has been argued that the "puny efforts of man" in the destruction of fishes are as nothing when compared with the destruction caused by their other natural enemies; but such arguments must be read with an important qualification. Such arguments are in a measure true when they refer to the capture of fishes that are suitable from their size for the food of man; but in my opinion they are absolutely incorrect when they include the wanton and unnecessary destruction of fry, which, through ignorance or perversity, is continually taking place. Hundreds of thousands of tons of living fry, and of under-sized fishes which are only fit for manure,—representing billions of fishes, of which thousands of millions would, in due course, arrive at maturity and become valuable as food,—are annually caught and destroyed without benefiting mankind in the slightest degree; and such a state of things needs to be remedied.

Various remedies have been proposed, the most important of which are—the establishment of "close times," during which it should be illegal to fish; and the enlargement of, and the keeping open widely, the meshes of the nets when actually at work. The first of these remedies is impracticable as regards

trawling, because different fishes are in season at different periods of the year, and because it would be impossible to make a trawl-net that would catch at different periods only particular descriptions of fish; moreover, the question would have to be considered how the fishermen could be employed—that is, maintained—during the "close times." The alternative remedy, in my opinion, is the correct one, and could be carried out with advantage to fishermen as well as to the advantage of the public.

In 1879 the late Mr. Frank Buckland consulted me on this subject. At that time he was impressed with the idea that the escape of fry from a trawl-net could be secured by simply increasing the size of the mesh of the "cod-end." I demonstrated to him, in a practical fashion, the fallacy of this notion; and satisfied him that the desired result could not be obtained by simply enlarging the size of the mesh. In shape a trawl-net is something like an ordinary funnel, the cod-end forming the spout; the meshes of the net are diamond-shaped, and, when at work, the extremity of the cod-end is tied up; the consequence is that, the more weight there is in the cod-end, the closer together the meshes are drawn. Since then I have been experimenting as to the best method of making a mesh that will keep widely open; and the net which now forms part of my trawling apparatus is the result of my experiments. I have found that a cod-end, which is made entirely

with square meshes, or partly with square meshes and partly with diamond-shaped meshes, and which is closed at the bottom and opened at the side for the emptying of the net, is the best adapted for the escape of fry or refuse from the net.

The size of the mesh of a drift-net must, of course, depend upon the description of fish which it is intended to catch. Sprat-nets are not suitable for the catching of herrings or pilchards, nor are herring or pilchard nets suitable for the catching of mackerel, although, unfortunately, herring or pilchard nets will catch small mackerel, and sprat-nets will catch young herrings and young pilchards. I do not, however, see how this is to be avoided, although, I think, it would be advantageous if the size of the meshes of each of these descriptions of nets were regulated.

The herring fishery, however, is of such vast national importance that, in my opinion, only such nets, the meshes of which would allow of the escape of small herrings, should be permitted to be used. It is well known that, as regards fish, the general public consider "size" to be a synonym for "quality." The upper and well-to-do classes will not purchase such small soles as are technically known as "tongues" and "slips," and the poorer classes invariably prefer a large herring to a small one. Hence it is desirable, from a commercial point of view, to catch large herrings, and, as far as possible, large herrings only. This, however, cannot be done with nets the meshes

of which are very small. The size of the mesh of the herring-net should, therefore, be regulated by act of parliament. What then, it will be asked, should the size of the mesh be? That is a pertinent question, and I will try to answer it.

I have already shown that in the olden time the word "last" meant a weight of two tons, and that in the fourteenth century the number of herrings in a last was fixed by act of parliament at 12,000. Such a number of herrings must be very prime fish indeed to weigh two tons, and such fish could not be caught in a small-mesh net. A net, the meshes of which are one inch square, will catch such herrings. In 1809 parliament, guided by the experience of centuries, enacted that no person should use any net for the taking of herrings the mesh of which was less than one inch from knot to knot, and that the penalties for every such offence should be the burning of the net itself, and a fine of £40, a very heavy fine indeed when the difference in the value of money between then and now is taken into consideration. These provisions were included in the convention that was made between England and France in 1839. The Convention Act remained in force until 1864, when it was abrogated; and in 1868 the regulations referred to were repealed. This is much to be regretted, because, ever since, the tendency on the part of fishermen has been to use nets of a smaller and smaller mesh; and it is in con-

sequence no uncommon circumstance now to see nets the meshes of which are so small that there are from forty to forty-four of them in a yard. This is a suicidal policy, and for two most important reasons;—firstly, because, as the public prefer large herrings to small ones, whenever there is a large delivery of small herrings, the prices fall rapidly; and, secondly, because small-mesh nets will *kill*, but *will not catch*, large full herrings. A small mesh simply catches a large herring by its nose and not by its gill-covers; and, therefore, the herrings so meshed and killed are held so slightly that, when dead, they drop out of the meshes with the mere motion of the sea, or the hauling in of the net, and, of course, are lost to the fishermen. I deprecate, therefore, the policy which causes such loss, because, if the masses were supplied with an article more suited to their tastes, fishermen would greatly benefit by it in hard cash, even though the quantity of herrings caught might be much less than it would be if nets with smaller meshes were used. For these reasons, I am of opinion that the old legal mesh of one inch from knot to knot is a just and proper size. Such a mesh has caught, and would continue to catch, large herrings and those of ordinary size, while it has permitted, and would continue to permit, young or small, and therefore comparatively worthless, herrings to escape.

As to the means for making the use of such a mesh compulsory in Great Britain there can be but

one suggestion, and that is, to re-enact the provision contained in the 48th of George III., chapter 110, as regards the mesh of the herring-net, with the same or similar penalties attached thereto for offending against it. As, however, fishermen have been permitted since 1868 to have meshes of any size they chose, it would be only fair and right to give them a reasonable time for the wearing up of their small-mesh nets, and the obtaining of others with the mesh of the regulation size. Such a reasonable time would be a period of three years; and I would suggest, therefore, in the event of that portion of the act of 1809 referring to the mesh of the herring-net being re-enacted, that it should not come into operation until three autumnal herring seasons should have passed from such re-enactment.

I advocate legislation in the matters to which I have referred because I believe that such legislation would be for the general good. In my opinion the true principle upon which legislation for our sea-fisheries should be based, is that *individual enterprise should be trammeled as little as possible either by imperial legislation or municipal ordinances.* Indeed, protective or repressive legislation is true and just only when it protects a community from the reckless indifference of those whose aims are "concentred all in self;" or when it represses the rash and guilty, though ignorant, acts of those who, for their own immediate personal benefit, would speedily "kill the

goose that lays the golden eggs." All history teaches us that every branch of industry flourishes best in the atmosphere of free competition, and that even the protecting caresses of a government are frequently as dangerous to the well-being of an industry as is the open hostility of its most implacable opponents. The history of the herring fishery at Great Yarmouth, as I have already shown, proves this fundamental truth in the most convincing manner.

It may be taken for granted that much of the legislation which has been repealed was inherently bad, and that it never would have been enacted had it not been for the ignorance of the legislators who framed it. Prevention is better than cure, in law as in everything else; and no legislative enactment, or order in council regarding the sea fisheries, should be passed without *previous consultation* with those who are actually engaged in the prosecution of them. Indeed, no order in council affecting an important industry should be *permitted* to be made at all, for the simple reason that the framers of such orders and their advisers have, as a rule, no practical or special knowledge of the industry which they undertake to regulate, and they are, in consequence, as likely, if not more likely, to do harm as they are to do good. This may seem to be a sweeping assertion, but it is nevertheless true. A couple of illustrations will explain my meaning far better than the most elaborate argument, and here they are:—Some few

years ago an order in council was passed, directing that on board all decked fishing-boats the same cubical sleeping accommodation should be provided for each fisherman as, according to law, is provided on board merchant ships for every sailor. It may be readily imagined that such an order created the greatest consternation amongst the owners of fishing craft, for the simple reason that if the order in council had been carried out, it would have been *physically impossible* to have provided for the stowage of the necessary fishing gear. Representations on the subject were made to the Board of Trade, but they were of little avail until it was pointed out that fishing-boats were exempted from the operation of the act in question, when, of course, the order was rescinded. But such an order ought not to have been passed, and it never would have been passed had its framers, or their advisers, known anything of the law upon the point, or had they had any practical acquaintance with fishing craft. Again, in 1879 the Board of Trade, through their surveyors, directed that all fishing-boats should be fitted with iron stanchions upon which to exhibit their side-lights. This order was enforced to the great inconvenience and expense of boat-owners, until it was shown that the carrying it out would be all but impossible, and exceedingly dangerous to human life, and that the order itself was in excess of the power granted by the act of parliament under which it was made.

The order was then withdrawn; but no compensation was awarded to those boat-owners who, in obeying the directions of the Board of Trade surveyor, had of necessity gone to very considerable expense. In this case, too, the order in council ought not to have been made; and it would never have been made had its framers, or their advisers, been practically acquainted with the subject.

That no legislative enactment regarding the fisheries should be passed without previous consultation with those who are actually engaged in the prosecution of them would seem to be a self-evident proposition, but the necessity for such a statement is now being clearly and forcibly demonstrated. In 1879 an order in council was passed by which the rules regulating the exhibition of lights by fishing vessels when actually engaged in fishing were greatly altered. The attention of the government was called to these alterations by E. Birkbeck, Esq., M.P., and the order in question was placed in abeyance until a select committee of the House of Commons should report thereon. The report of that committee when issued, proved beyond all doubt that the proposed regulations are *impracticable*, and that the advisers of those who framed them are *utterly unacquainted* with the conditions under which fishing vessels would have to carry out such regulations. The committee unhesitatingly and unanimously condemned the order in council; and it is to be hoped that in future the

fishing interest will be spared the necessity of having to defend itself against the suicidal regulations of well-meaning, but misguided and misguiding men.

Legislation for fishermen and fishing-boats should be *distinct and separate* from that for sailors and vessels belonging to the mercantile marine; or, if embodied in one act of parliament, legislation for the one class should be *clearly distinguished* from that for the other class, and for this very important reason—that legislative enactments which are right and proper for the one class, are frequently impracticable in execution when applied to the other class. Such legislation should be distinct, if not separate, because of the difference in the size of the respective vessels, because of the difference in the number of the crews of such vessels as compared with their respective tonnages, and because of the special exigencies attending the prosecution of the sea fisheries. Indeed, it has been found absolutely impossible to carry out in some respects on board fishing-boats the laws which apply to merchant vessels. I have already shown that, in the matter of cubical accommodation, regulations which are proper for merchant vessels cannot be carried out on board fishing-boats; and that, in the display of side-lights, rules which would be safe and judicious on board a large trading ship, would be dangerous in the extreme if applied to a small fishing vessel.

The inapplicability of the same legislation to both

merchant ships and fishing vessels might be shown in a variety of ways, but I will content myself by simply referring to the most recent illustration of it. On the first of August in 1880, there came into operation a new act relating to shipping, one clause of which virtually did away with imprisonment for desertion. At the time the act was passed, it was believed, even by the introducer of the bill, that it would not affect the fishing interest. As a matter of fact, however, it did and does apply to fishermen as well as to merchant sailors, and the consequences to boat-owners have been serious in the extreme; and, if not remedied, it will be well nigh ruinous to the fishing interest. Under a clause in this act, a fisherman has only to give to the owner of the boat, on board which he has engaged to serve, forty-eight hours notice of his intention to leave, and he can legally do so, notwithstanding that, by his act alone, the boat is prevented from going to sea and completing her voyage, and that the owner and the rest of the crew, ten in number, are thereby precluded from earning their livelihood. There ought, of course, to be the utmost freedom in the making of a contract between a boat-owner and a fisherman; but when the contract is once entered into, the boat-owner and the fisherman should equally be compelled to perform their respective parts of such contract. A fishing voyage means not a single fishing trip, but the fishing for a whole season; and a boat-owner, before

he can send his vessel to sea for even the first trip, must make provision in the shape of fishing gear and other necessary appliances for the whole season. To place him, therefore, and those of his crew who are willing and even anxious to perform their parts of the contract, at the mercy of one man, and to enable that one man to break his contract without rhyme or reason on his part, is absolutely and absurdly unjust. It would be quite as reasonable to permit a soldier to give forty-eight hours' notice of his intention to quit the service. I am sure no government would agree to such a proposition as that; and what is right and just for a *government*, is surely right and just for an *individual*.

As the law at present stands, fishing-boats are compelled to carry the initial letters of the port to which they belong, and their port numbers, upon their bows and in their mainsails, whilst merchant vessels are exempted from doing so. The object of carrying such letters and numbers is that the vessels bearing them may be instantly known at sea. This is right and proper; but, in the interests of fishermen, the same or a similar practice should be extended to merchant vessels. Indeed, it is most important that they should carry some highly-distinguishing marks, because they are so much larger than fishing vessels. Fishing-boats at sea are frequently run into and run down by merchant vessels; and the vessels so running into them or running them down often sail away,

regardless of the cries of the fishermen who are left to their fate, in order that the vessel may get away without being known, and so escape the consequences of the carelessness of her crew or the bad seamanship of her captain.

In the interests of boat-owners and fishermen the law which now gives concurrent jurisdiction to county-court judges and justices of the peace in salvage cases should be altered, as it gives rise at times to unseemly exhibitions. The power to settle these cases should be *vested entirely in the hands of either one or other* of these authorities. In the interest of salvors and salvees the power should be vested in the justices of the peace. These gentlemen are equally as competent to decide these cases as are the county-court judges; and the parties interested would be benefited for these reasons,—because the cases would be settled without delay, and so prevent the expenses which are necessitated by waiting for the ordinary monthly sitting of the county court; and because the expense of a hearing before a justice of the peace is much less than that of a hearing before a county-court judge.

At present boat-owners and fishermen "sailing by the share"—and nearly all fishing-boats now sail either wholly or partly on the share principle—are compelled to sign their contracts in the presence of a "superintendent or deputy-superintendent of a Mercantile Office"—in other words, at the Custom-

house. This entails not only unnecessary expense but great inconvenience, and sometimes considerable loss of time; because it must be remembered that the working hours at the Custom-house are very short. To my mind the law in this respect is an absurdity. Any one person can legally witness the sale and transfer of any vessel no matter what her value may be; and what is sufficient for the transaction of a most momentous piece of business ought surely to be sufficient for the binding of a mere temporary and, comparatively speaking, unimportant bargain.

The necessity for boat-owners to make half-yearly returns is a work of supererogation, as it entails needless trouble and useless labour, both upon boat-owners and Custom-house officials. It is said that the returns are wanted for statistical purposes. *For such purposes they are utterly worthless.* Nine-tenths of them are incorrect, and from the very nature of the case must be so. Even if they were correct, it is difficult to imagine for what statistical purpose they would be of use. Returns for the protection of life or the recording of death at sea are important; but such returns are not needed in the cases of fishing-boats, which are rarely unseen or unheard of for more than a very few days together.

In the interest of the fishing industry an alteration should be made in the law respecting *compulsory pilotage.* The ordinary law makes the owner of a vessel liable for whatever damage she may do; but,

when the vessel at the time she does damage is in charge of a compulsory pilot, the owner is exempted from all liability. Under such circumstances the compulsory pilot and not the owner is liable; and the consequence is that, for damage to property and compensation for loss of life, fishermen have frequently to look to a mere man of straw, and with what result can be easily imagined. This is unjust and ought to be remedied. The true remedy is to do away with compulsory pilotage.

The charges which are made by Receivers of Wreck for taking depositions respecting damage or loss at sea should be abolished. The information given is important, and is necessary for statistical purposes; and the Receivers should be paid for their services by the Board of Trade, and not by the sufferers who supply the information. It is really too bad to compel a man to give information of any loss he may sustain, and then to charge him for giving such information. Even if he be insured his loss is necessarily great, and it is adding insult to injury to charge him for giving a description of the disaster that beggars him.

It would be a great boon to fishermen, both professional and amateur, if anchors and chains lost at sea were exempted from the regulations which now apply to "droits." The regulations of the Board of Trade, and the antiquated claims of the Admiralty in respect of lost anchors and chains,

inflict a great hardship on fishermen all round our shores, but particularly so in the channels of the Thames, and in the roadsteads on the coasts of Norfolk, Suffolk, Essex, and Kent. Owing to the exigencies of the weather, vessels frequently break adrift from their anchors, or are compelled to slip from them; and the consequence is that, in those places, the bottom of the sea is literally studded with anchors and chains that have been so lost. These hidden obstructions cause an immense destruction of fishing gear, such parts of the sea being as dangerous to work as is the ground off Lowestoft, which is so cumbered with huge stones that it is popularly known amongst fishermen as the "Churchyard." As a matter of fact, not one captain in a hundred returns to look for his lost anchor; and, of course, no buoy is left to warn the unsuspecting fisherman of the hidden snare that lies in wait to wreck his gear and rob him of his net. The damage and loss to fishermen from this cause alone must amount to thousands of pounds annually, a loss which falls very heavily upon this most deserving and hardworked class. It will be asked—Why are not these anchors swept and weighed so that this danger may be avoided? The simple answer is, that the regulations of the Board of Trade are such as to cause it to be a thankless and costly task. The salvors are bound, under the most dire penalties, to deliver the "swiped" anchor to the Receiver of Wreck,

and to him only. They are not permitted to deliver it even to the *actual owner*, although he may be present, and willing to receive it and to pay for its salvage. Only recently an anchor was "swiped" in Yarmouth roads, and taken by the salvors to Lowestoft, where lay the vessel from which it had been lost. The captain had been communicated with, and he was willing to receive the anchor and to pay for its salvage. But the Receiver of Wreck interfered; the salved anchor and chain and also the salvors' boat were seized, the salvors were treated with contumely, and—because redress was demanded—legal proceedings were taken against them. The result was that the salvors were convicted and fined; the majesty of the Law, and the dignity of the Receiver of Wreck being upheld at the expense of justice.

The amount which is allowed by the Board of Trade for the salvage of anchors and chains is only 2s. per hundredweight, but an extra 3d. per hundredweight is allowed for carriage if the distance they are brought be short—say five or six miles; and 6d. per hundredweight if the distance be great. Such a sum does not much more than pay for the use and the wear and tear of the boats and gear which are necessary for sweeping and getting the anchors and chains, and certainly does not fairly remunerate the salvors for their arduous and toilsome labor. Consequently, anchor sweeping is not an

employment to which the "toiler of the sea" readily and cheerfully turns.

The anchors and chains, after having been delivered at the Admiralty court-yard, are surveyed, a guess at their weight is made, and the salvors—after cooling their heels for some hours, or it may be days, at the Receiver's office—are paid according to the assumed weight. The anchors and chains are not weighed unless at the request of the salvors, who, in that case, are charged the expense of weighing. Salved anchors and chains are kept for a year, in case they may be claimed, after which they are sold, generally by public auction. According to the Board of Trade circular which was issued in March, 1867, such anchors and chains, before being sold, should be sent to the nearest anchor-and-chain proving establishment in order to be tested, because, if they stand the test, they can be sold with proof certificates; and thereby, says the Board of Trade circular, "the salvors and all concerned will be benefited." As, however, the salvors are compelled to take 2s. per hundredweight ready cash in settlement of all claims, it is hard to see how they can be "benefited" by the ultimate result of these official proceedings. One can readily conceive that 2s. per hundredweight is quite as much as would be left for the salvors after deducting the commission and all the costs of the Receiver of Wreck; indeed, the whole proceeding looks very much like a process for his special benefit. Surely

the general interest would be better served if salvors were allowed to take all the benefit that is to be got for recovering derelict anchors and chains. In the event of an owner appearing, they would make their own bargain with him or they would be paid the customary salvage. Were this right waived, the loss to the revenue would be infinitesimal, whilst the fishing community would be greatly benefited, because lost anchors and chains would then be instantly "swiped," and with their removal a source of very great danger to fishing property would disappear.

The manorial rights to the fore-shores of the sea which are claimed by various individuals ought not to be permitted to continue to exist, but should be acquired by the Crown at their fair value for the benefit of our fishermen, and, through them, of the public at large. These manorial rights are relics of the dark ages, some of the feudal laws of which were so hideous in their nature that they are unnamable at the present day. How such rights could have originated, and how they could have been legally recognized, it is difficult to imagine; because it is repugnant to common sense that land which is at the mercy of every flood-tide, or shell-fish which are found thereon in consequence of such flooding, can be claimed as private property. Such rights are a restraint, as well as a tax, upon the shell-fish industry. If such industry need to be regulated,

it should be regulated by the government for the benefit of the community at large, and not be left to be preyed upon by private individuals for their own personal aggrandizement. The shell-fish industries along our coasts are of considerable value, and they are yearly increasing in importance, the mussel fishery especially so. Mussels are used for bait whenever and wherever they can be procured, and the demand for them, therefore, greatly exceeds their supply;—one Scotch fishing port alone requires 5,000,000 annually. This fact of itself should attract the attention of the government to the subject, and induce it to take measures for the preservation and propagation of the mussel similar to those which are taken for the preservation and propagation of the oyster, the crab, and the lobster. The fore-shores around our island are admirably adapted for mussel-farms, and with but small care and at little expense such farms would soon become an important item of national wealth. Ever since the thirteenth century mussels have been systematically cultivated at Aiguillon in France, and at the present time the mussel-farm there yields a revenue of more than £50,000 per annum.

The law which relates to drift-fishing boats and trawlers, when actually employed in fishing, is one-sided, and therefore unfair, and ought to be modified. It is in precisely the same state as it was fifty years ago, when trawling was in its infancy, and when it

was swaddled with legal regulations, amongst which were,—that the trawl-beam should not exceed 88 feet in length; that the iron trawl-heads should not exceed 287 pounds in weight; that the ground-rope should not be heavier than 110 pounds; and that the mesh of the net should not be smaller than one inch and three-quarters from knot to knot. At that time the drift-net fishing was *par excellence the* fishing, and so jealous were the Powers of it that, by the convention which was entered into between England and France in 1839, trawlers were forbidden with their gear down to come within a distance of at least three miles of all boats fishing for herrings or mackerel. As the trawl-fishing increased in importance these regulations gradually became obsolete, until in 1864 the convention between England and France terminated. The law, however, relating to drift-fishing boats and trawlers when actually employed in fishing remains virtually the same, and entails great hardship upon the trawlers. The tendency of recent legislation has been to place drift-net fishing-boats and trawlers upon the same footing, but the actual law is oracular in its utterance, and has been interpreted by lawyers entirely in favor of the drift-net boats. The law as it now stands (Article 15) says:—"Trawl-boats shall not commence fishing at a less distance than three miles from any boat fishing with drift-nets, or, having shot their nets, shall not come nearer to such boat than the distance above mentioned." This is qualified

by Article 16 in the following words:—"No boat fishing with drift-nets shall shoot its nets so near to any other boat which has already shot its nets on the fishing-ground as to interfere with its operations." This latter clause leads to the conclusion that it was the intention of the legislature to prevent drift-net fishing-boats from interfering with the operations of trawlers equally as it was to prevent trawlers from interfering with the operations of drift-net fishing-boats; and that it should be as imperative on the part of a drift-net fishing-boat to keep three miles from any trawler with its gear down, as it is imperative for a trawler to keep three miles from a drift-net fishing-boat when its nets are shot.

As a matter of fact, however, drift-net fishing-boat crews have entirely disregarded the law, and have thrown all the onus of obeying it upon trawlers; and in this course of action they have been upheld by various legal decisions. Drift-net fishermen openly assert that a trawler must give way to them; and they act upon this belief by often shooting their nets within the required distance of a trawler when it has its gear down, and both to leeward and windward of it. I have heard drift-net fishermen declare that they have intentionally shot their nets amongst a whole fleet of trawlers, careless of the consequences that might ensue, because they knew that, whatever damage might be done to their nets, some one or other of the trawlers would have to pay for it. The

appearance of a small drift-net vessel amongst a fleet of trawlers has, therefore, the same effect upon the trawlers as the appearance of a sparrow-hawk has upon a flock of small birds. This is most unfair to trawling vessels, which are now much larger and finer vessels and, therefore, far more expensive and valuable, than drift-net fishing-boats. It did not much matter fifty years ago, because the number of trawling vessels fishing in the North Sea was then very small; but during the last half-century trawling vessels have increased a hundredfold, and since the introduction of ice as a means of preserving the fish caught in a fresh state, their out-put has increased enormously. The Fishery Commissioners estimated in 1866 that the supply of trawl-fish to the London market alone was fully equal to the supply of cattle; and, from calculations which I have made upon reliable data, I am convinced that the supply of trawl-fish during twelve months in England is now fully equal to, if it does not far exceed, both in bulk and value, the deliveries of drift-net fish during the same period. As a logical sequence, therefore, and as a matter of justice, the regulations which govern drift-net boats and trawlers should be so revised and modified as to place the two classes of vessels upon the same footing. And it is all the more imperative that such revision and modification should take place, because, as matters stand at present, a premium

is held out to the owners of rotten drift-nets to shoot them where they might be trawled into, in order that they might be able to replace them with sound and good nets at the expense of the owner of the trawler that might be unfortunate enough to foul them.

In my opinion the remedy for this unfortunate state of things is twofold. In the first place, during the autumnal herring-fishing season the sea might be mapped into districts, and trawlers and drift-boats might be kept widely separate from each other, by being compelled to confine their operations to the districts which might be respectively assigned to them. In the event of either one or other fishing outside their respective limits, the boat sustaining or causing damage, as the case might be, should be held liable, and be mulcted in damage and costs. Were this the law, the trawler invading the limits of the district of the drift-net boats would be liable for any damage it might do to any drift-nets, while at the same time it would have to bear any loss it might sustain to its own gear; and *vice versâ*, any drift-net boat invading the limits of the districts of the trawlers could recover no compensation for any loss it might sustain to its own nets, while it would have to pay for any damage it might cause to the gear of a trawler. Of course, if such damage should be unavoidably done during a gale of wind, the law as regards "inevitable accidents" would

take its ordinary course. The effect of such a law would be that, during the autumnal herring season, a "close time" for ground-fishes would be established in the districts fished by herring-boats, and such a "close time" would, I am sure, prove to be very advantageous to trawlers. A "close time" for herrings would also be established in the districts fished by trawling vessels.

In the second place, the old and misleading limit of three miles should be abrogated, and the masters of fishing vessels should be enjoined to take up proper berths before shooting their nets, and to navigate their vessels with care and skill whilst fishing; and, in the event of damage being done to the nets of drift vessels or to the gear of trawlers, the vessel not taking up a fair and proper berth, or not being navigated with due care and skill, should be adjudged to be in fault, and should be mulcted in the damages and costs accordingly. I have said that the present rule as to the distance at which trawlers and drift vessels should be from each other when shooting their nets is misleading. It is so, because, when it is hazy at sea, which it very frequently is, it is impossible to see such lights as are ordinarily carried at a distance of even one mile, and trawlers and drift-boats, accordingly, often approach very close to each other without being aware of each other's presence. It often happens that the first intimation which the crew of a trawler

has of being close to a drift-net boat is seeing the bowls attached to the nets of the drift-boat floating past, or hearing them knocking against the trawler's side. Both trawling vessels and drift-net boats are yearly increasing in number, and the sooner this burning question between them is settled, the better will it be for the pockets of boat-owners and the tempers of their crews. To make such a law as this thoroughly efficacious, it should be agreed to by the other nations engaged in fishing operations, and a convention with them for that purpose should be entered into accordingly.

An international convention would also be highly advantageous in removing that curse to fishermen which is known as "coopering." A "cooper" is nothing more nor less than an unlicensed floating grog-shop. Ostensibly a fishing-smack, it is fitted up for trading rather than for fishing purposes, and the articles its proprietor deals principally in are bad liquors and tobacco, which he sells or barters to fishermen at sea. I am told that the proprietor of a "cooper" prefers fish or fishing-boat stores to money; that he sends heavy consignments of both "prime and offal" fish to various markets; and that he finds a ready sale for trawl-ropes and bridles and such-like fishing gear amongst the Jews at Nieuwe Diep and other seaports on the Continent. The "cooper" attends upon fishing vessels at sea like a bird of prey, and it is the primary cause of

much immorality and dishonesty, and even of worse crimes. It should be at once "improved off" the surface of the sea.

It has been said that it would be advantageous to appoint "Boards of Conservators, who should have the management of all the fisheries in the country, with power to impose licences;" but, in my opinion, such boards would be anything but "desirable." I have already argued that individual enterprise should be trammeled as little as possible either by imperial legislation or municipal ordinances. Within the limits which I have stated, I believe that no restrictions whatever should be placed upon the prosecution of the fisheries; and, in my opinion, licences to fish would be an *unnecessary* restraint, as well as an *impolitic* tax. Local boards of conservators would be far more ornamental than useful, would cost much more than their services would be worth, and, were they narrow-minded and bigoted instead of being cosmopolitan in their ideas, would be a nuisance and a hindrance, if not something worse, to those whose interests it would be their duty to watch over and protect. The experience of the past teaches this in trumpet tones.

The first appointment of a public officer in connection with the fisheries was, as I have already stated, in 1635, when a patent was granted to one Thomas Davies, of Great Yarmouth, to gauge and seal all red-herrings according to quality; but it was

soon canceled, because it was found to be injurious to the interests of the fishermen. The Scotch Fishery Board was established in 1808, and it has existed up to the present time upon false assumptions of its value. Its principal duties have been, and are, the collecting of statistics regarding the herring fishery, and the branding of cured herrings according to quality. All its other duties are, or might be, performed by the executive of the country, without a single shilling of extra expense. Upon this point the Lords of the Treasury in 1855 gave it as their opinion that the "functions of the Board" were *not* to "keep order, on shore or afloat, among the fishermen, or to enforce the observance of conventions between this country and foreign powers;" and that the "protection of Scotch fishermen must be left to the Board of Admiralty, or to the coastguard by arrangement with the Board of Customs." Their lordships, therefore, expressed it to be their opinion "that the time has now arrived when the fishery trade may be entirely thrown open, and the artificial system created by the brand of the Fishery Board may be abolished, substituting for it the sounder system already adopted with regard to all other articles of trade;" and their lordships accordingly proposed, "in accordance with the opinion expressed in the House of Commons, to abolish the system of branding herrings for exportation."

The statistics which the Fishery Board collects are,

I readily admit, useful as far as they go; but statistics are required not only of one particular fishery, but of *all* the fisheries of the United Kingdom; and such statistics, with other equally valuable information, might be collected and arranged at much less expense than these partial statistics cost at present. Indeed, the thousands of pounds which this Board costs the country every year would be amply sufficient to obtain all the information to which I refer, not only for Scotland, but for the whole of the United Kingdom. The Fishery Commissioners in their report which was issued in 1866 state that at that time the actual cost of the Scotch Fishery Board to the country was £7000 per annum. Even were it to cost the country nothing, it should be dissolved, because, in truth, it is a delusion and a snare. The branding of the herrings, or rather of the barrels in which the herrings are, is nothing more nor less than a farce. Curers are *not* compelled to have their barrels branded, and as a matter of fact the greater portion are not branded at all. Upon this point the Fishery Commissioners reported in 1866 that "so long as the barrel is of the right size, the herrings it contains may be putrid without the fishery officer having the power to condemn them;" and they gave it as their opinion that the "continuance of the white herring brand and inspection is unjustifiable."

The sole argument in support of keeping the Fishery Board in existence is, that the brand is

necessary to the curers for the selling of their herrings upon the Continent. The supporters of the Board aver that barrels having the official brand "pass to the heart of Europe, and even to the Black Sea, current as a bank note." As a matter of fact this is simply untrue. The brand is *not* a guarantee of the quality of the herrings within the barrel, and foreign buyers know this full well and act accordingly. The herring report for the last season of the celebrated firm of Jahns and Nilsen, which was issued at Hamburg on the 23rd of February, 1881, proves this statement up to the hilt. Messrs. Jahns and Nilsen say:—"We have never seen so bad stuff with government brand as this year. We have had herrings, whereof three-fourths were torn in the bellies, herrings without filling, quite sea-sticks; we have had herrings out of which the half was of the very smallest matties, without any milt and roe, all branded as Crownfulls. We have returned some sample barrels through the German consul to the Board of Fishery in Edinburgh, with certificates of quay-masters and brokers that they were returned in the same state as landed; but the Board refused even to inspect them, *if we would not sign beforehand a writ that we were not to make any claims against the Board. We have got the sample barrels returned stinking* without being inspected. We say, therefore, either the officers must be much more strict in inspecting, and *the Board of Fishery must be*

responsible for their officers' doings, or the government brand is of no use at all." With such evidence before one, who can say that the Scotch Fishery Board is not a delusion and a snare, and that it ought not to be instantly abolished?

I would then at once dissolve the Scotch Fishery Board, and with the money which is now almost wasted in keeping it in existence, I would establish a system by which all the required information, statistical and otherwise, of all the fisheries of the United Kingdom, should be regularly and methodically obtained. The head of this system should be a central authority whose offices should be in London. This central authority should be subject to the Home Secretary, and should consist of the Fishery Commissioners. The salary of each of these gentlemen should be £1,000 a year, for which sum, I opine, government would always be able to command the entire services of gentlemen fully qualified for the performance of the duties required of them. The entire coasts of the United Kingdom should be divided into districts, and for each of these districts a sub-inspector should be appointed by the central authority, subject to the approval of the Home Secretary. The salaries of these sub-inspectors should vary according to the importance of the district, from £100 to £200 a year. These sub-inspectors should be gentlemen of ability and practical knowledge, and their duties should be to supply periodical reports of all matters

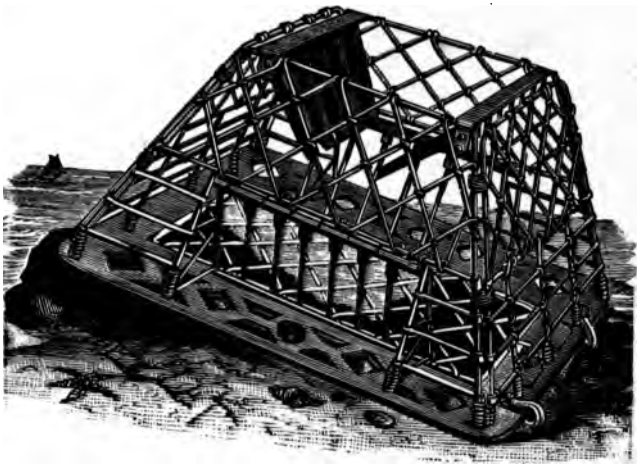
relating to the fisheries in their several districts, and to make such special inquiries respecting fish, fishermen, fishing-boats, and fishing gear, as from time to time they might be directed to make by the central authority. These periodical and special reports should be collated by the central authority, and should be embodied by it in an annual report which should be laid upon the tables of both houses of parliament. By this system the ordinary statistics would be obtained with accuracy, whilst special information would be continually forthcoming of interest to the general public, and of great value to piscicultural naturalists.

Just a few words about the fishermen themselves, and I have finished. That they are rough and uncultured is true, but their being so is no fault of theirs; they are rough because their calling makes them so, and they are uncultured because hitherto neither their parents nor the state have educated them. Yet, though unlettered, they are sagacious to a degree, and use their practical knowledge with marvellous intelligence. Many of them are utterly unable to read and write, and know nothing about taking an observation even for latitude; yet, with simply the lead and the compass, they navigate their vessels in all weathers, and at all times, with an accuracy that is perfectly astonishing, and very frequently act as pilots in the middle of the sea to captains of large vessels, who are supposed to be not

only sailors, but nautical men in the strictest sense of the word. Look upon them with a kindly eye, take no notice of their harmless foibles, teach them to read and to write, provide them with interesting literature for perusal at sea, and pleasant amusement when on shore, and, depend upon it, you will find them to be as gentle and docile as they are strong and courageous.

NORWICH: PRINTED BY FLETCHER AND SON.

CRAB & LOBSTER TRAP.



Invented by John Wm. de Caux, Member of the Inventors' Institute.

AWARDS.

Special Prize and Bronze Medal at the National Fishery Exhibition at Norwich, 1881.

Silver Medal and Diploma of Honour at the Fishery Exhibition at Great Yarmouth, 1881.

THE SPECIAL ADVANTAGES OF THIS TRAP ARE:—

1. That it stands fairly and firmly at the bottom of the sea.

2. That crustaceans can easily enter it, both from the sides and the top. When in the sea the wooden bars at the top float upwards and form a marine pit-fall.

3. That crustaceans when once inside cannot escape unless they be under-sized. The horizontal bars may be placed any distance apart, but to comply with the law, the spaces between them should be wide enough to permit the egress of small crabs which it is illegal to catch.

4. That it opens at the bottom, and can be cleared without trouble or danger.

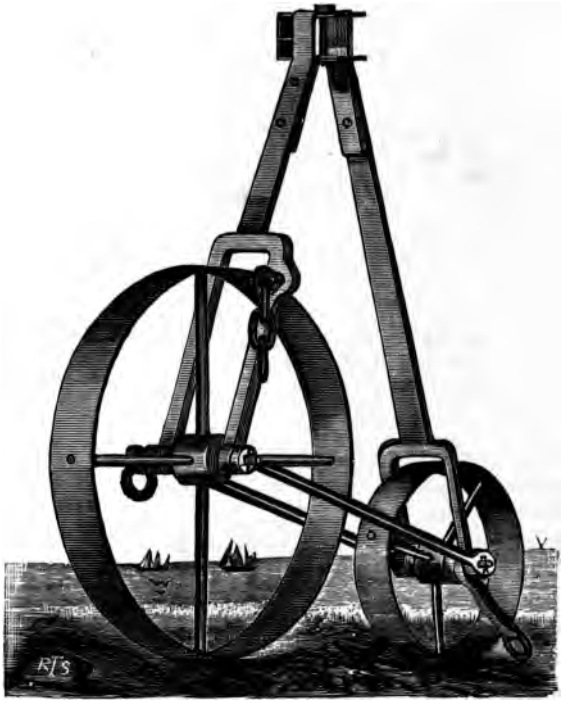
These Traps are made of galvanized iron, and are supplied at 16s. 6d. each, by the Inventor and Patentee,

JOHN WILLIAM de CAUX,

Fish Salesman,

GREAT YARMOUTH.

TRAWLING APPARATUS.



INVENTED BY JOHN WM. de CAUX, MEMBER OF THE INVENTORS' INSTITUTE.

AWARDS.

Silver Medal and Diploma of Honour at the International Fishery Exhibition at Berlin, 1880.

Special Prize and Silver Medal at the National Fishery Exhibition at Norwich, 1881.

THE SPECIAL ADVANTAGES OF THIS APPARATUS ARE AS FOLLOWS:—

1. It goes upon wheels which roll over, and are not dragged through, the ground.
2. The trawl-beam can be carried at any height from the ground, and it is fixed to, or unfixed from, the wheels without difficulty or danger.
3. The ground-rope is fitted with rollers to facilitate its progress over the ground.
4. Inside the net a smaller net is fixed so as to form a funnel to prevent the escape of fish.
5. The cod-end of the net is made so that when fishing the meshes are kept widely open to allow Immature Fish and Refuse to escape therefrom.
6. At pleasure the net can be disconnected from the trawl-beam at the bottom of the sea, and can be shut up and brought to the surface separately from the trawl-beam.

The complete Apparatus, or any part or parts thereof, can now be supplied to yachtsmen and smack-owners on the following terms:—

Trawl-beams, properly fitted, 1s. 6d. per foot.

Roller ground-ropes for yachts, 1s. 6d. per foot; and for smacks, 1s. 3d. per foot.

Set of galvanized iron trawl-wheels, to carry the beam 18 inches from the ground, £3 5s.

Set of galvanized iron trawl-wheels, to carry the beam 27 inches from the ground, £5 10s.

Set of iron-and-wood trawl-wheels, to carry the beam three feet six inches from the ground, suitable for a large smack, £10 10s.

Prices for other sizes, and for the disconnecting gear, supplied on application to the Inventor and Patentee,

JOHN WILLIAM de CAUX,

FISH SALESMAN,

GREAT YARMOUTH.

